DOCUMENT RESUME

ED 297 768 IR 052 489

TITLE	Automated Resource Sharing in Massachusetts: Activities, Functions and Policies Supporting the Long Range Program. Approved by the Board of Library Commissioners.
INSTITUTION	Massachusetts Board of Library Commissioners, Boston.
PUB DATE	4 Dec 87
NOTE	221p.; For the 1983 plan, see ED 243 479.
PUB TYPE	Legal/Legislative/Regulatory Materials (090) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC09 Plus Postage.
DESCRIPTORS	Bibliographic Databases; Interlibrary Loans; Library Automation; *Library Cooperation; *Library Networks; *Long Range Planning; Online Catalogs; *Online Systems; *Shared Resources and Services; State Federal Aid; *State Programs
IDENTIFIERS	*Document Delivery; Library Services and Construction Act

ABSTRACT

A revised and updated version of a 1983 automation plan, this report describes the long range program for resource sharing activities by the library network in Massachusetts, a program which is funded in part by the Library Services and Construction Act. The basis of the network--the development, continuation, and linking of machine-readable databases and physical access points into the information resources of the state's libraries--is detailed and the shared resources provided in cataloging/interlibrary loan services, reference/database services, and circulation/interlibrary loan services are considered. Major aspects of the program are described, including funding, governance, needs, goals, and evaluation. Three major recommendations are discussed in detail: (1) the development of access points into informational resources, and development and linking of databases to provide greater access opportunities to resources; (2) the facilitation of document request and document delivery procedures; and (3) the development of an ongoing education program on resource sharing. An appendix lists points to consider when developing cooperative arrangements among libraries, and details the operational guidelines of the Network Advisory Committee of the Massachusetts Board of Library Commissioners. Each of the 21 chapters contains bibliographic notes/references, and a 174-item bibliography is provided. (EW)

AUTOMATED RESOURCE SHARING IN MASSACHUSETTS: ACTIVITIES, FUNCTIONS AND POLICIES SUPPORTING THE LONG RANGE PROGRAM

Approved by the Board of Library Commissioners
4 December 1987

Massachusetts Board of Library Commissioners
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CONTENTS

This document supports the Long Range Program 1987 - 1991 required by the federal Library Services and Construction Act. The design of the Long Range Program includes all federal programs under L.S.C.A. In addition, during the development of the Program in 1985 - 1986, the various Task Groups envisioned that with supplemental material, review and revisions, the Long Range Program would come to include other State programs. By 1991, the Long Range Program should reflect as comprehensive a library services program as possible.

The Long Range Program cannot be an all inclusive document. It is, and should remain, a document which includes brief background information along with appropriate subgoals, objectives and tasks, policies, criteria and procedures. Therefore, other documents are necessary to supplement the information and action program which comprise the basis of the Program. For example, a Committee was established in 1986 to work with the action plan concerned with Strengthening Metropolitan Libraries. The planning document developed with Committee participation will not, in itself, become part of the Long Range Program, but will assist in the revision of the Metropolitan Libraries action plan as the utilization of the planning process proceeds. Other program areas which may develop supplemental materials include literacy, and public library construction.

This document is intended to support and supplement, clarify and update, not replace, the Long Range Program's Title I Public Library Areas with Inadequate Services" and Title III action plans. In addition, the document is intended to assist in meeting the Library Services and Construction Act requirement that the Long Range Program and annual program of each State include a statewide resource sharing plan which shall identify interlibrary and resource sharing objectives to be achieved during the period covered by the Long Range Program (P.L. 98-480, Section 304, (a) through (c)'. Further, this document is intended to be evolutionary and dynamic, and to be continually reviewed and updated as necessary. The Long Range Program must also be reviewed and revised to reflect the changes recommended by this document.

"Automated Resource Sharing in Massachusetts: Activities, Functions and Policies Supporting the Long Range Program"supports the Long Range Program 1987 - 1991 required by the federal Library Services and Construction Act. The design of the Long Range Program includes all federal programs under L.S.C.A. In addition, during the development of the Program in 1985 - 1986, the various Task Groups envisioned that with supplemental material, review and revisions, the Long Range Program would come to include other State programs. This document does not replace the Long Range Program; rather, it provides the necessary information for the continuing development and revision of the Program, especially as the Program becomes broader to include objectives and activities not necessarily supported solely with federal funds.

This document is intended to provide a conceptual framework for the structuring and activities of a multitype resource sharing library network utilizing automated technologies. As a structure, the decentralized network is composed of independent units which serve as access points to the information resources of Massachusetts, New England, and the United States. These units, such as circulation/ILL (interlibrary loan) clusters and dial-up access libraries are themselves linked to one another through telecommunications, and through cooperative agreements. Further, the document is intended as a starting place for librarians, trustees, library governing officials and other administrators to consider the concept and practicalities of automated resource sharing, and as a guide when questions concerning funding considerations arise.

The purpose of the network is to help librarians to locate, request, and receive information wanted by their patrons as efficiently and effectively as possible. Two assumptions are made. First, people have a need for all types of information located in all types of sources in all types of libraries. Second, libraries cannot be self-sufficient because they lack the financial resources and/or the physical space to acquire and store all the materials needed by their patrons to meet their needs. Resource sharing provides libraries with a means to meet those needs.

While it is important, and necessary, for all libraries to be resource sharers, it should be emphasized that resource sharing and interlibrary loan are not substitutes for provision of basic library services, and are not substitutes for local collection development. All libraries have a responsibility to provide basic services and to acquire materials needed regularly by their patrons. Resource sharing is intended to supplement basic library services. Libraries cannot and should not depend upon resource sharing to totally meet the needs of all of their users.

It should also be noted that not all libraries want, or have a need, to automate. Whether or not to automate a library function remains a local decision.

The basis of the network is the development, continuation, and linking of machine-readable databases and physical access points into the information resources of the state's libraries. In its simplest form, an access point, such as a circulation control/ILL cluster or dial-up access library, identifies which library owns a desired item. Requesting and receiving that item may occur at the access point or through the user's local library. Not all libraries will become access points, although it is planned that such "non-access" libraries will have indirect access to

informational resources through access libraries. In the network concept, access points utilize automated means to locate materials, ascertain availability status if possible, and request the items. In the future, delivery may become more automated as machine-readable formats evolve, and improved facsimile machines are introduced. The point is that the network's purpose is to locate information resources and provide for their sharing using automation as an effective and efficient process - a means to an end. The network is not to become a bank of computers.

This document is a revision and update of the automation plan approved by the Board of Library Commissioners in 1983. Since that time, access points have increased in number, resource sharing activities have been modified, and technology has increased in its sophistication and, in many cases, decreased in cost. A revision was necessitated because of the changes in automated resource sharing over the past four years. For example, the 1983 plan included a microcomputer-based network component called the INC (Information Network Center). Its purpose was essentially the same as the dial-up access library. However, the INC's microcomputer was to be shared by two or more libraries. It was envisioned in 1982-3 that the initial cost of a microcomputer system at approximately $7,000 would increase, and many individual libraries would not be able to afford to acquire or maintain one on their own. That prediction was completely wrong, and the concept of several libraries needing to share a microcomputer has been dropped. Other instances exist which required the 1983 plan be updated to take advantage of emerging technologies, such as CD-ROM and telefacsimile.

Users' and Libraries' Needs

People's need for information in our complex society is growing and becoming more obvious. In a society that is becoming increasingly information dependent, there are few libraries, however well-funded and managed, that are capable of meeting all the information needs of their constituents.

There is increased access to information for library users when libraries agree to cooperate with each other to share their resources. Resource sharing is no longer supplemental to local library operations, but has become a basic element. A network of resource sharing cooperatives would increase the effectiveness of locally-based efforts, particularly when founded upon use of automated technologies.

The Massachusetts Board of Library Commissioners in approving the Massachusetts Long Range Program 1987 - 1991 reaffirmed the overall goal developed in 1977 for libraries in the Commonwealth to meet the needs of users. The spirit and intention of this stated goal provides the necessary framework with which to begin, and continue, the design of a resource sharing network:

> **To provide every resident of Massachusetts with equal opportunity of access to that part of the total information resource which will satisfy individual educational, working, cultural, and leisure-time needs and interests, regardless of individual location, social or physical condition, or level of intellectual achievement.**

Therefore, one of the objectives related to the overall goal for meeting needs is concerned with resource sharing:

Increase citizens' access to Massachusetts information resources by sharing resources as broadly and effectively as possible.

Librarians acknowledge the impossibility of maintaining comprehensive collections and of providing totally comprehensive services to their users based upon a single library's resources. The rate of increase in both the boundaries of knowledge and the complexity of information over the past several decades has put an end to the era in which any library could seriously aspire to complete self-sufficiency.

Librarians have long realized that service to their patrons can be markedly improved through resource sharing arrangements among libraries in order to provide the user with access to resources beyond the local collection. Therefore, the emphasis of meeting the users' information needs is shifting from local possession (ownership) of resources to access. The concept of expanding access through sharing resources has become central to planning in nearly every type of library.

Often the cooperation among libraries for resource sharing purposes, particularly when automated technologies are applied, is referred to as "networking".

The goals of networking reflect those of resource sharing - increased access, improved user services, and the ability to cope with the increased availability of informational materials Generally, the objectives of a resource sharing cooperative can be summarized briefly:

1. shared access to collections (through expanded interlibrary loan and borrowing privileges);
2. coordinated collection development to avoid unnecessary duplication of materials and to broaden the scope of the total shared collection;
3. shared access to bibliographic data; and
4. development of technical expertise of staff members through continuing education.

The primary reason to utilize automation for resource sharing is that computers provide the necessary processing capabilities required for effective and efficient retrieval in terms of response time, storage capacity, and the necessary linkage and switching between components. Problems of information access are alleviated and the speed in receiving information is improved when computer and telecommunications technologies are employed.

Essentially, resource sharing networks provide collectively three activities related to the goals of increased access and improvement of services:

-cataloging/ILL services - database files of shared machine-readable bibliographic records which are created by libraries during the cataloging process and which indicate library ownership; these files may be searched for interlibrary loan purposes.

-reference/source database services - database files which provide the searcher with bibliographic citations and/or abstracts of resources indexed in the database; with full text, such as articles;; or with

current news stories. These databases are not necessarily based upon cataloging data. In addition, a user may not necessarily need to use interlibrary loan to receive the actual information sought because the full text of the information desired may be available online or through a supplier which provides, rather than loans, a copy of the information.

-circulation/ILL services - database files of machine-readable bibliographic records which not only indicate ownership but also current availability (on the shelf and available for loan, in circulation, on the shelf for reference use, etc to the requester.

Principles

These principles are considered basic to the resource sharing network in Massachusetts:

1. Each individual has the right to access the information that meets his or her needs.

2. Each library has an obligation to strive to provide services and to develop resources which meet the needs of their users as frequently as possible at least a majority of the time. Resource sharing is intended only to supplement the provision of local library services and the development of local resources. It should not replace either. Further, automated resource sharing is a means to an end - to assist the librarian and/or the user to locate material and/or information which helps to meet their particular need - and is not an end in itself.

3. All network services should be provided at a level of operation as close to the user as possible. A local library should be the user's most efficient and appropriate service center. Therefore, network services should be provided through libraries as often as possible. The network should support local library services, not compete with them.

4. The objectives of the resource sharing network should be realized without negative impact to the missions of participating libraries, although their methods of operation invariably may be adjusted. All libraries have a responsibility to collect the materials needed regularly by their own constituents. Resource sharing is not a substitute for local acquisition, only a supplement.

5. It is essential that the network enable individual libraries to maximize the gains of resource sharing while allowing for local flexibility; network members should understand and recognize existing individual constraints.

6. The resource sharing network should be built upon existing cooperative systems and existing library strengths. New resource sharing systems, built upon strong individual library collections and services, should evolve where existing cooperatives are no longer effective. The network should not compete with existing arrangements, but rather improve, redirect, and extend those already in existence and offer alternative approaches which will prove more valuable and useful.

7. Networking is not free. Besides equipment and material costs, staff time is necessary to provide shared services. Therefore, each participant must be able to balance benefits with investment. This

balance need not be measured solely in the traditional interlibrary loan concept of net borrowing versus net lending of materials. Attention also should be given to the increased benefits of improved access to more resources. A cost-benefit analysis is an appropriate methodology to study the benefits of network investment.

8. The financial and fiscal basis of the continued operation of network components must depend upon local rather than federal, state, and private funding sources. Local funding sources include assessed membership fees, cost recovery/reimbursement fees, and allocations from the member institutions. Governmental and private grants and intermittent local fundraising are unreliable as a financial base since they are more apt to change annually.

9. Resource sharing efforts should not be limited to within the State. When and where economically, technically, and politically feasible and desirable, the State's resource sharing network and its related services should overcome geo-political boundaries, broadening access into the total information resources of the region and the nation.

Mission Statement and Activities

After exploring the issues of needs assessments, resource sharing, networks, the role of automation in networking, and barriers to networking, a mission statement for developing an automated resource sharing library network in Massachusetts is necessary to serve as a framework for network activities:

MISSION

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

One of the purposes for applying automation to library operations is to increase the opportunities for residents to access the sources they require to meet their informational needs. Networks have evolved as resource sharing mechanisms which provide the capability for effectively and efficiently increasing access to information resources at the broadest level through databases of machine-readable records.

The library network concept for Massachusetts is based upon the linking, usually through telecommunications, of its various decentralized components. Those components include:

1. the clusters and their members
2. Those libraries with the capability and permission to access the cluster's bibliographic databases using a microcomputer
3. members of bibliographic utilities and/or bibliographic service centers
4. the Regional Public Library Systems
5. library cooperatives utilizing automated technologies in their functions to create and/or access databases, such as union lists of serials
6. standalone circulation (or online catalog) systems

The network is designed to increase access to resources based upon a decentralized structure composed of independent cooperative systems of various types telecommunicating with other cooperatives to: locate needed material (documents and/or bibliographic citations); ascertain availability status (if technologically feasible); and to place requests for the desired items. Material is delivered through conventional methods although telefacsimile and digital transmission or other electronic means should be considered, depending upon technology, costs, effectiveness, and need. For users, the resource sharing network, with its local basis and decentralized access can provide access to the full scope of information resources to meet their needs.

Activities related to the Mission Statement are:

1. **Develop access points into informational resources, and develop and link databases to provide greater access opportunities to resources.**

   A. develop machine-readable databases to improve access through cataloging/ILL services
   B. develop serial databases through NELINET and the New England Union List of Serials (NEULS) project
   C. increase access to reference/source database services, and develop other specific purpose databases as appropriate
   D. expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed
   E. increase access into the cluster's bibliographic databases for libraries in the Commonwealth
   F. increase access into the clusters' databases for library users
   G. facilitate access between standalone databases and cluster databases, and between standalone computer databases.
   H. increase access to other databases of informational resources
   I. explore increasing access to informational resources through shared, integrated systems
   J. increase access into informational resources and improve system cost effectiveness and efficiency by exploring and implementing remote distributive processing systems

2. **Facilitate existing document request and delivery procedures.**

   A. facilitate document request procedures
      The most efficient manner in which to transmit an interlibrary loan request is by sending a request electronically to the identified owning library. Whenever possible, libraries should submit interlibrary loan requests in an electronic format.
   B. facilitate document delivery procedures
      The document delivery mode chosen to fill a request should utilize the fastest, least expensive, and most reliable means of information transmission available.

3. **Develop an ongoing education program on resource sharing.**

Standards

Standards are necessary in any cooperative effort. In the automated

resource sharing network, standards will be adopted to facilitate the coordination of resource sharing in a network environment by ensuring compatibility.

Bibliographic control consists of those activities which are necessary to create and organize records identifying and describing library materials. If the objective is to share resource access points (clusters, libraries dialing-into a cluster, participants of bibliographic utilities, etc., a method of communicating bibliographic data is needed. By standardizing the structure, content designation, and data content of the records (as with the U.S. MARC format used by the Library of Congress), a high degree of compatibility can be achieved.

Elements of the interlibrary loan request form should be agreed to in the cooperative agreements between clusters, between a cluster and those libraries using dial-up means to access the cluster, and between other access points as necessary.

Standards utilized within the network will be evolutionary as the technology and the network develop. The Network Advisory Committee and Board of Library Commissioners' staff will continually monitor standards policies and operations.

Funding

The most successful resource sharing cooperatives are those in which member libraries have made significant commitments with funds from their operating budgets and which view the cooperative services as an integral part of their essential operations.

Because of the financial unpredictability of categorical grants, local network participants must be responsible for the system's operational costs. Only those clusters and other cooperative efforts that can be maintained without grant money will be viable in the long run.

The primary source of revenue for maintaining clusters and other cooperative projects will be membership fees paid by libraries from their operating budgets. Federal funds administered by the Board of Library Commissioners are not used to support ongoing operations. State funds provided to the regional public library systems may be applied towards maintaining and/or operating any cooperative project, such as a cluster or a union list of serials, or for any purpose as determined in the annual Plans of Service and related budgets.

Services between clusters, and between clusters and libraries using microcomputers to access cluster databases, can be cost recoverable/reimbursable subject to state and local laws and cooperative agreements. Being charged for loans can be a problem to libraries. What often occurs is that libraries will bypass those libraries charging for loans, thereby putting more stress on libraries with liberal lending policies. It is unfortunate that libraries have a need to charge fees at all However, it is an ideal situation in which a library borrows as much as it loans, and it is the reality of many institutions that fees must be charged.

Governance

Governance, in the context of a library network, is concerned with the

relationships among the participants and institutions with respect to accessing the informational resources, communication between access points, and document request and delivery systems. Governance permits those using the network to express their interests and concerns, and to establish goals and objectives as well as the policies by which goals and objectives are to be achieved.

It is recommended that cooperatives formally organize themselves under articles of incorporation. Specifically, library cooperatives in Massachusetts should organize themselves as non-stock, non-profit corporations under Chapter 180 of Massachusetts General Laws. In addition, all library cooperatives should file for federal tax exempt status under Internal Revenue regulation 501 (c) (3).

Further, it is recommended that library participation in resource sharing efforts (such as circulation/ILL control systems, accessing a cluster via dial-up, a union list of serials cooperative, utilizing a bibliographic utility, etc. with other libraries, vendors, service providers, state government or others) be based upon formal written agreements or contracts minimally defining individual and cooperative responsibilities.

Legislation

To facilitate automated resource sharing in the Commonwealth, it is recommended that at least two legislative proposals be studied, drafted, and filed with the General Court.

1. Reimbursement of Interlibrary Loan Net Lenders

Legislation which will provide partial reimbursement to interlibrary loan net lenders excluding intra-cluster interlibrary loan should be drafted and filed. Such legislation should be regulated by the Board of Library Commissioners - for example, what constitutes an interlibrary loan, how and what statistics are to be kept, establishing a minimum interlibrary loan activity level and determining the ratio of the number of items loaned to the number of items borrowed in order to qualify for partial reimbursement, etc. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners.

2. Amending Cable (Community Antenna Television Systems) Legislation

Legislation which would permit inter-municipal linkages of CATV systems for the purpose of data communications should be drafted and filed. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners.

3. Non-Resident Use of Public Libraries

The Board of Library Commissioners has, over the years, advocated for the passage of legislation which would provide partial compensation to public libraries with a high ratio of non-resident circulation. With passage of such this legislation in 1987, the Board of Library Commissioners will pursue the effort to establish a state budget account to support this program.

Telecommunications

Automated resource sharing in Massachusetts is based upon telecommunications linkages between libraries and computer systems, between computers systems, and in many cases, between libraries. It is not an exaggeration to state that automated resource sharing is almost totally dependent upon these telecommunication linkages because of the decentralization of the various network components.

Telecommunications is of critical importance to resource sharing efforts. Two issues usually arise when discussing telecommunications and its impact on resource sharing - costs and reliability. Inefficiency in applying telecommunications technology and procedures hampers effective resource sharing and seriously affects costs.

To improve telecommunications costs and reliability, any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment should have in place a telecommunications configuration which utilizes as few lines as possible between and among cluster members and the central site, and should have a configuration which can bypass temporarily-failed (fours hours or more) telecommunication links so that a library still has no less than 20% of its terminals (libraries with four or less terminals should have at least one terminal) connected online in realtime to the central site.

Distributive remote processing may reduce telecommunications costs and decrease (or at least maintain) the usage of the computer processor at the central site, alleviating the need for additional computer processors to handle increases in transaction loads. Each cluster should explore the possibility of implementing a distributive system involving the central site and remote cluster participant.

Collection Development and Management

As stated in the Principles, each library has an obligation to strive to provide services and to develop resources which meet the needs of their users as frequently as possible at least a majority of the time. Resource sharing is intended only to supplement the provision of local library services and the development of local resources. It must not replace either. Further, automated resource sharing is a means to an end - to assist the librarian and/or the user to locate material and/or information which helps to meet their particular need - and is not an end in itself.

Resource sharing and automated technologies may be applied toward expanding and improving two of the library's primary functions - collection development and collection management. Resource sharing facilitates access to informational sources which may impact upon collection development in an individual library, or upon a cooperative group of libraries individually and collectively. Automated systems may be utilized to provide library managers with pertinent information concerning collection use and resource sharing activities.

The benefits of cooperative or coordinated collection development arrangements among libraries provide for some or all of the following options: greater selectivity in some areas; coordination of library materials storage and preservation activities to reduce unwanted redundancy

or unintended duplication of effort among libraries; and identification of a group of libraries committed to collecting for specific subject, format, or linguistic areas on which other libraries could rely in a coordinated collection development and resource sharing environment

A cluster-wide collection development project using the information from the existing automated system illustrates that the application of management information systems to collection development and management has become more practical with the introduction of computer systems in libraries. Such management decision systems can supply data on usage, cost, age, subject, and publisher distributions, as well as other characteristics of the existing collection and new acquisitions.

Another contribution of automation to collection development and management is the dramatic improvement of access to rare, unique or valuable resources. Currently such materials must be carefully preserved and/or access limited because of the fragile nature of the item or because of its value. However, if the item's information and character (typology, illustrations, etc.) can be captured through optical disk technology, such as the videodisc, the original can be preserved and appropriately stored while the digital duplicates are widely made available for use. There are numerous methods which employ automated technologies in the process of materials preservation. For example, an item's information and character (typology, illustrations, etc.) can be captured through optical disk technology, such as the videodisc, and the original can be preserved and appropriately stored while the digital duplicates are made widely available for use. Preservation of the item, and the inclusion of ownership information in one or many databases, serves to increase access to the resource.

Role of the Massachusetts Board of Library Commissioners

The Massachusetts Board of Library Commissioners is the state agency possessing the statutory authority and responsibility for library development in the Commonwealth. In this position, the Board initiates, establishes, and exercises primary leadership for, and direction of, the Commonwealth's effort to develop and improve library resources and services.

The Board of Library Commissioners has the responsibility and legislative mandate to plan, develop, establish, implement, coordinate, monitor, and evaluate an automated resource sharing, multitype library network for the Commonwealth. It is recommended that the role of the Board in relation to the network be:

1. to implement the automated resource sharing network program by assuming responsibilities for the overall development and coordination of network activities and aspects of the network as appropriate.

2. to draft and propose legislation and seek funding to facilitate the development and growth of the network.

3. to act upon the recommendations of the Statewide Advisory Council on Libraries (SACL) as applicable to the Long Range Program or activities and aspects of the network.

The Network Advisory Committee (NAC)

The Network Advisory Committee has been established to assist the Board in its communication function by serving as a standing Committee of representatives from all types of libraries and resource sharing efforts. As an issues forum, the NAC will assist the Board in identifying issues related to resource sharing activities, and work towards their resolution. Further, the NAC will assist the Board in developing and implementing an evaluation process of the progress that the various network components have made toward increasing access to informational sources and improving services to the State's residents.

Evaluation

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee shall be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations.

It should be emphasized that this document is intended to be evolutionary and dynamic, to be reviewed and revised regularly. Several important issues, such as collection management and development, clarifying and defining roles and responsibilities, document request and delivery, and preservation of materials for resource sharing purposes are not yet fully developed and require additional study. Relevant aspects of this document will be revised as the issues are clarified and policies, procedures, and recommendations developed.

MAJOR RECOMMENDATIONS

The Mission Statement should be reaffirmed and the revised Statement of Related Activities should be adopted:

> Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. **develop access points into informational resources, and develop and link databases to provide greater access opportunities to resources**

All libraries are encouraged to convert their holdings into machine-readable form through a utility or by using another process, service or product. (Chapter 10, p. 1, 1.1)

The following minimum activities should be offered by a bibliographic utility or service center to be considered as providing cataloging/ILL services:

a. online in realtime access to machine-readable bibliographic records from various sources including the Library of Congress

and from original cataloging from participating libraries
b. supports AACR II
c. supports full MARC format
d. provides access to the bibliographic records of all participating libraries including local holdings information
e. supports standard, ASCII terminals and microcomputer-based dial access with common terminal emulations
f. supports query by search key (author, title, and others)
g. supports online entry of interlibrary loan requests through an interlibrary function module
h. provides union list capability by definable parameters
i. can be interfaced with local circulation control/online systems. (Chapter 10, p. 2, 1.1.1)

All clusters which have received in excess of 50% of the costs associated with the acquisition and/or upgrade of the central site computer system should utilize a bibliographic utility or bibliographic service center as the primary or secondary source of machine-readable records. It is recommended that clusters consider establishing centralized cataloging centers to facilitate conversion of participating libraries' acquisitions through bibliographic utilities. (Chapter 10, pp. 2-3, 1.1.2; Chapter 15, pp. 5,8)

It is important that clusters develop and maintain telecommunications linkages with bibliographic utilities for conversion. An interface may be needed for the online in realtime transfer of machine-readable bibliographic records processed during conversion. Therefore, clusters may request funding, as available and feasible, for the capital costs of developing an online in realtime interface for conversion purposes with bibliographic utilities recognized as such. (Chapter 10, p. 30, 1.11.3)

Cooperative library groups receiving funds from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install a system that supports AACR2; accepts, retains, and outputs records in the U.S. MARC format; and can support necessary bibliographic authority control. Libraries receiving funds administered through the Board of Library Commissioners to access the clusters' bibliographic databases should agree to convert their ongoing acquisitions utilizing the U.S. MARC format and AACR2. (Chapter 11, p. 1)

1. Any cooperating group of libraries receiving funds administered through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should have a full U.S. MARC record format bibliographic database. Library clusters which have, or plan to have, less than the full U.S. MARC record format as their database will not be considered for funding. (Chapter 15, p. 3)

2. Resource sharing cooperatives should adopt standardized holdings statements as they become available and should strongly encourage vendors to incorporate the standards into their systems. (Chapter 11, p. 1)

To assist retrospective data conversion for libraries in Massachusetts, cooperating library groups receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with the

central site system or equipment upgrade should allow, for a period of time and under conditions as specified on the contractual agreement between the cluster and the Board of Library Commissioners, network participants to copy the database at their cost for use in their own conversion projects. However, such an effort should be considered within the issue of copyright protections claimed at the time by OCLC. No cluster will be required to provide all or part of its database for copying by another network participant if OCLC claims it would infringe upon their copyright, whether or not the copying and transfer of the database would, in actuality, violate copyright. (Chapter 15, p. 3)

OCLC/NELINET or UTLAS, Inc. are recommended as bibliographic utilities. (Chapter 15, p. 5)

The Board of Library Commissioners will consider cluster requests for portions of the capital funds, as available and appropriate, directly related to making a bibliographic utility and/or cluster's circulation/ILL control system's database more accessible for libraries to utilize for conversion and interlibrary loan purposes. (Chapter 10, p. 3, 1.1.5; Chapter 15, p. 9)

Retrospective conversion of collections of a general nature is the responsibility of the local library. Retrospective conversion of special collections considered unique in content will be considered for State funding (as available) for cluster participants. Library cooperatives which include public libraries as full members will be considered for State funding, as available and appropriate, if the converted machine readable records would be made accessible through a bibliographic utility and/or a cluster system. (Chapter 10, p. 3, 1.1.3; Chapter 15, p. 4)

Conversion of current acquisitions is a local responsibility. (Chapter 10, p. 3, 1.1.4)

To provide increased access to the NEULS union list of serials for all libraries, it is recommended that NEULS participants make their offline union list products available to other libraries on a cost recovery basis. Offline products include lists in print format and CD ROM. (Chapter 10, p. 4, 1.2.1)

It is recommended that the Board of Library Commissioners encourage the development of an offline combined union list of serials of Massachusetts NEULS participants on CD ROM, to be made available to all libraries on a cost recovery basis. A printed version is considered to be impractical because of the size. (Chapter 10, p. 4, 1.2.1)

There are other union list of serials projects in addition to those on NELINET's NEULS. To expand the holdings of the NEULS database to be as comprehensive as possible, other union list of serials projects will be considered for funding by the Board of Library Commissioners if the converted bibliographic records are also included in a NEULS database. (Chapter 10, p. 4, 1.2.2)

Libraries are encouraged to explore reference/source database searching. The Board of Library Commissioners will consider requests for capital funding, as available from State sources, for a microcomputer, modem, terminal emulation software and initial training to initiate reference/source database services. Funds will not be available for any continuing or operational costs associated with the searching process.

(Chapter 10, p. 5, 1.3)

Expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed. (Chapter 10, p. 6, 1.4)

Because of the importance of circulation/ILL control system clusters in facilitating resource sharing, existing clusters should be expanded in size and scope to include more libraries as participants when and where it is feasible, considering hardware, software, and other factors. (Chapter 10, p. 6, 1.4)

When it is not feasible to include more participants in existing clusters, new, shared online circulation/ILL control system clusters should be encouraged and developed. (Chapter 10, p. 8, 1.4)

The Board of Library Commissioners should provide state and federal funding, as available and feasible, for the capital costs associated with establishing or upgrading the central site computer system of a circulation/ILL control system cluster to increase the number of participating libraries as access points, or for the establishment of new clusters when necessary. Funds can only be used for the central site computer system and software, its installation, and the training of personnel. Funds will not be provided for equipment, software, or for a service which serves the needs of an individual institution. Funds will not be provided for central site preparation costs, nor for the operations of the cluster. Federal funds cannot be applied toward telecommunications equipment. (Chapter 10, p. 8, 1.4.1)

Clusters should not be established without assistance from a consultant experienced in the process. Cooperatives planning to establish a cluster may apply for federal funding administered through the Board of Library Commissioners for a consultant to assist in planning the cluster, the development of system specifications and the issuance of the Request for Proposals, vendor negotiations, and system acceptance testing. (Chapter 10, p. 8, 1.4.2)

Library cooperatives applying for funding from any source administered by the Board of Library Commissioners to establish or expand a cluster circulation/ILL control system should consider the following requirements as minimum criteria when selecting a vendor's system.

a. should be capable of accepting, maintaining and outputting a U.S. MARC record
b. provides the member libraries with inventory control of library material through an automated circulation control function
c. provides bibliographic and holdings information about materials owned by cluster members
d. facilitates interlibrary loan and resource sharing by having the capability of providing online availability status information of the materials in the database to all libraries belonging to the cluster
e. should be capable of providing multi-tier intra-cluster searching within the database. For example, the system should be able to minimally display the holdings of individual libraries, then a second level of holdings of other libraries as specified in parameter tables, and then a third level in which the holdings of all cluster libraries are displayed.

f. should have an electronic messageing facility for intra-cluster messages such as interlibrary loan requests
g. should have an online public access catalog capability
h. system should be capable of generating various statistical reports including non-resident circulation for public libraries
i. system should be physically expandable to accommodate additional libraries and functionally expandable to accommodate additional applications software
j. system should be capable of providing communication gateways to reference/source database services and electronic mail systems from most terminals in use on the system
k. should be able to implement the protocols from the Library of Congress' Linked Systems Project
l. should be able to remove and transfer the MARC bibliographic database to another computer system without loss of data and format
m. the system should be capable of accommodating dial-up access to the bibliographic database from libraries and from users in business and home environments

Only "turnkey" systems implementing an "off the shelf operating system and software" will be acceptable for funding administered through the Board of Library Commissioners. (Chapter 10, pp. 8-9, 1.4.3)

Although, it would improve inter-cluster communications and coordination and dramatically facilitate resource sharing, the Board of Library Commissioners will not standardize on one vendor to provide circulation/ILL services for the Commonwealth's clusters. However, to ensure that a cluster acquires appropriate functional hardware and applications software, the Board of Library Commissioners reserves the right to disapprove of a cluster's choice of vendor if it has provided funds to the cluster in excess of 50% of the costs associated with the establishment or upgrade of the central site computer system. (Chapter 10, pp. 9-10, 1.4.4)

Clusters which have received in excess of 50% of the costs associated with the establishment or upgrade of the cluster's central site computer system with funds administered by the Board of Library Commissioners should accommodate dial-up access from other Massachusetts clusters and non-cluster libraries as appropriate and feasible, negotiated between the cluster and the Board of Library Commissioners. (Chapter 10, p. 10, 1.4.5)

All clusters which have received in excess of 50% of the costs associated for the establishment and/or upgrade of the central site computer system with funding administered through the Board of Library Commissioners should provide access to their bibliographic and holdings information databases for non-cluster libraries. (Chapter 10, p. 11, 1.5)

Clusters which have received funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with establishing and/or upgrading the central site computer system should set aside five percent of all the system's ports, but no more than eight and no less than three, for access by libraries using microcomputers on a dial-up basis. Clusters should be willing to implement dial-up access. The Board of Library Commissioners should consider providing the necessary funding, from State sources as available and appropriate, to enable the clusters to acquire adequate central site computer equipment to accommodate dial-up access. (Chapter 10, p. 11, 1.5.1)

Clusters should establish incoming toll-free lines into their central site for use by dial-up access libraries so that telecommunications costs do not become a barrier for libraries to access the bibliographic and local holdings information databases. The Board of Library Commissioners will consider allocating State funds, as available, to partially support the necessary centralized telecommunications costs of dial-up access. (Chapter 10, p. 11, 1.5.1)

Libraries wanting to implement dial-up procedures are encouraged to acquire the appropriate computer system to access the circulation/ILL services of the cluster. The recommended minimum system configuration will be determined based upon the technology available at the commencement of the grant round.

The Board of Library Commissioners will consider requests from libraries to acquire this configuration when State funds are available for categorical grant purposes. If a library receives funds administered through the Board of Library Commissioners, the library should meet the following criteria:

1. agree to the annual fee assessed by the cluster
2. accept reasonable guidelines and procedures to access the cluster's database, outlined in an agreement between the cluster and the library
3. obtain written acknowledgment that the cluster can accommodate an additional dial-up member.
4. agree to input their current acquisitions into the cluster's database and/or into a bibliographic utility providing cataloging/ILL services accessible by the cluster.

   It is recommended that the clusters allow dial-up libraries to contribute their holdings to the cluster's database. If necessary, the cluster may request funding administered by the Board of Library Commissioners to acquire the mass storage devices necessary to store the MARC records of the dial-up libraries.

5. agree to participate as a dial-up member for no less than three years, unless the library becomes a member of a cluster, or decides to return the computer system to the Board of Library Commissioners.
6. agree to purchase the specific hardware and software recommended by the Board of Library Commissioners, such as the computer model and internal configuration, communications software, and modem.
7. agree to attend the appropriate training program implemented by the cluster, and/or the regional public library system, and the computer system vendor(s). (Chapter 10, pp. 12-13, 1.5.2)

An alternative to dial-up access is to make copies of the cluster's database available for libraries to search locally. Clusters could arrange to periodically have their databases mastered and then distributed on CD ROM. Copies of the CD ROM database could be distributed to other clusters, and sold on a cost recovery basis to non-cluster libraries. (Chapter 10, p. 14, 1.5.4)

Online public access catalogs should be installed and implemented in clusters when economically and technically feasible to increase access to users of the bibliographic and other database files available, and improve resource sharing efforts. The Board of Library Commissioners may consider

requests from clusters for State and federal funding, as available and appropriate, to acquire central site hardware and software to implement online public access catalogs. Requests for funding for local costs such as terminals, and costs for any site preparation, operations and telecommunications are not appropriate. (Chapter 10, pp. 17-18, 1.6.1)

Because of anticipated technical and economical considerations of providing online public access catalog terminals, it is recommended (not required) that clusters consider a public access catalog program combining online public access catalog terminals, inquiry terminals and CD ROM databases. (Chapter 10, p. 19, 1.6.2)

Because of the potential for dramatically increasing access by library users to cluster bibliographic databases and the enhancement of the libraries' public image, it is recommended (not required) that clusters consider providing library users with the opportunity for dial-up access. If available, unused or underutilized ports which have been reserved on the central site computer systems for dial-up access by libraries may be reallocated for library user dial-up access, if technically feasible, and considering security issues. (Chapter 10, p. 20, 1.6.3)

Clusters are encouraged to consider the advantages and disadvantages of the utilization of a centralized telecommunications switch to facilitate dial-up access by library users. If this or a similar configuration has potential for use, two or more clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, an exploration of its functionality and applicability through a pilot project. (Chapter 10, p. 20, 1.6.4)

Equipment and software which facilitates the searching of standalone databases by clusters and/or by other standalones should be installed when economically and technically feasible. The Board of Library Commissioners will consider requests for funding, as available and appropriate, for projects which promote the reciprocal exchange of bibliographic and/or item information between standalones and clusters and between standalones of at least two types of libraries. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality. (Chapter 10, pp. 20-21, 1.7.1)

Clusters are encouraged to consider loading and/or creating other informational files in addition to the monograph bibliographic database for inclusion on their central site circulation/ILL control systems. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, to initially tape load or create a database which would improve and increase access to informational resources for library users. (Chapter 10, p. 21, 1.8.1)

Clusters should consider developing an integrated system which includes the following functions: acquisitions, cataloging, circulation, public access catalogs, serials, and resource sharing. Resource sharing includes intra-cluster electronic messageing, and the provision of gateways to other computer systems. Other informational database files should also be considered for inclusion such as information and referral files. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, for the necessary central site computer hardware and software to implement functions of an integrated system. The circulation and resource sharing functions should be present

before other functions will be considered. (Chapter 10, p. 23, 1.9.1)

Clusters should consider and explore the possibilities of remote distributive processing. Clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, for pilot projects to demonstrate remote distributed processing. Funds can be utilized for necessary central site hardware and software modifications required to implement remote distributive processing and the remote computers for no more than three of the cluster's libraries. Site preparation, telecommunications and operational costs are local expenses. (Chapter 10, p. 25, 1.10.1)

The Board of Library Commissioners encourages the consideration of clusters, non-cluster libraries, and vendors in developing microcomputer-based systems which would be compatible and/or interfaced with clusters to facilitate resource sharing. The Board of Library Commissioners will consider requests from libraries and/or clusters for funding, as available and appropriate, for a pilot project to develop such a system as described. (Chapter 10, p. 27, 1.10.2)

Clusters are encouraged to make an effort to establish inter-cluster communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. Clusters may request the Board of Library Commissioners to consider for funding, as available and feasible, pilot projects establishing inter-cluster linkages based upon LSP protocols to facilitate resource sharing efforts. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented. In addition, contracting libraries which directly provide interlibrary loan services to members in the regional public library systems may apply for funding administered by the Board of Library Commissioners, as appropriate and available, for a microcomputer and appropriate software which will be used to access cluster systems other than their primary cluster. (Chapter 10, p. 29, 1.11.1)

Linkages between cluster systems and standalone circulation (or online catalog) systems, and between individual standalone circulation (or online catalog) systems exhibit problems similar to those of inter-cluster linkages. Reciprocal access between clusters and standalones and between standalones would facilitate resource sharing. (Chapter 10, p. 29, 1.11.1)

Clusters and standalone circulation (or online catalog) systems are encouraged to establish communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. The Board of Library Commissioners will consider for funding, as available and feasible, pilot projects establishing linkages between clusters and standalones, and between standalones of at least two types of libraries, based upon LSP protocols to facilitate resource sharing efforts. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented. (Chapter 10, p. 29, 1.11.2)

In order to enhance network telecommunications:

1. It is recommended that the Board of Library Commissioners request the General Court to increase the existing state

funding level in order to reduce the costs associated with the telecommunications links within clusters, between clusters, and between dial-up libraries and the clusters. (Chapter 12, p. 5)

2. Any cluster receiving funds administered through the Board of Library Commissioners which exceeds 50% of the costs to establish and/or upgrade central site equipment should utilize a computer system that is capable of contentioning computer system ports. Any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment may only apply that funding toward a telecommunications configuration capable of contentioning with the cluster's central site computer system. (Chapter 16, p. 3)

3. To improve telecommunications costs and reliability, any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment should have in place a telecommunications configuration which utilizes as few lines as possible between and among cluster members and the central site, and should have a configuration which can bypass temporarily-failed (fours hours or more) telecommunication links so that a library still has no less than 20% of its terminals (libraries with four or less terminals should have at least one terminal) connected online in realtime to the central site. (Chapter 16, p. 6)

4. Whenever possible, toll-free lines should be established at the cluster central site to reduce the telecommunications costs between the remote dial-up access library and the cluster. The Board of Library Commissioners will endeavor to secure State funds to partially offset the costs of the toll-free lines. (Chapter 10, p. 30, 1.11.4)

5. Legislation which would permit inter-municipal linkages of CATV systems for the purpose of data communications should be drafted and filed. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners. (Chapter 14, p. 2)

6. There is a need in Massachusetts to link the various circulation/ILL control system in order to facilitate resource sharing. If clusters implement the protocols from LSP, librarians and library users will be able to search the bibliographic databases of the numerous clusters to identify the wanted sources, and to ascertain availability status. Such information should decrease the turnaround time of the interlibrary loan process. Several vendors are planning to implement the protocols from LSP, and full recognition and support of these protocols will encourage its development. Therefore, cooperative library groups receiving funds after July 1, 1989 from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install or upgrade only those systems which have

successfully passed the compatibility tests conducted through the test facility hosted by the Library of Congress. (Chapter 11, p. 3)

It is recommended that cooperatives formally organize themselves under articles of incorporation. Specifically, library cooperatives in Massachusetts should organize themselves as non-stock, non-profit corporations under Chapter 180 of Massachusetts General Laws. In addition, all library cooperatives should file for federal tax exempt status under Internal Revenue regulation 501 (c) (3). Library cooperatives wishing to be considered for funds administered through the Board of Library Commissioners for resource sharing projects should be established as a non-profit organization under Chapter 180, and cooperatives planning to purchase circulation/ILL control system central site equipment should additionally have federal tax exempt status.

Further, it is recommended that library participation in resource sharing efforts (such as circulation/ILL control systems, accessing a cluster via dial-up, a union list of serials cooperative, utilizing a bibliographic utility, etc.) with other libraries, vendors, service providers, state government or others be based upon formal written agreements or contracts minimally defining individual and cooperative responsibilities. (Chapter 13, p. 2)

Intra-cluster resource sharing and access to information sources can be improved if members approve and utilize cluster-wide collection development and management policies. All automated resource sharing clusters which have received funding administered through the Board of Library Commissioners in excess of 50% of the costs associated with the establishment and/or equipment upgrade of the central site computer system, should have membership-approved collection development and management policies, approved as to form by the Board's staff, in place by January 1, 1990. Because collection development and management policies should be proceeded by collection surveys, clusters may be considered for funding (as available and not to exceed $100,000 per cluster) to conduct analyses of members' collections to identify strengths and weaknesses, and to assist in preparing the policies. Other library cooperatives may also be considered for funding (as available and not to exceed $100,000) to conduct a member collection survey. (Chapter 17, pp. 3-4)

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee should be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations. (Chapter 18, p. 4)

2. facilitate document request and document delivery procedures

The interlibrary loan and information transmission process, including identification of bibliographic items, document request procedures, the handling of the request by the owning library, document delivery, and the return of the document to the owning library should be studied in order to increase effectiveness and efficiency. Library cooperatives, consortia, clusters or the regional public library systems may request funding, as available and appropriate, administered by the Board of Library Commissioners, to examine all or part of the interlibrary loan and

information transmission process. (Chapter 10, p. 33, 2.0.1)

The most efficient manner in which to transmit an interlibrary loan request is by sending a request electronically to the identified owning library. Whenever possible, libraries should submit interlibrary loan requests in an electronic format. (Chapter 10, p. 33, 2.1)

Clusters which receive funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with acquiring and/or upgrading the hardware and/or software of the central site computer system should have an intra-cluster electronic mail system usable in the interlibrary loan process available within the computer system. (Chapter 10, p. 34-35, 2.1.1)

It is recommended that ALANET become the common electronic mail system for Massachusetts libraries. It is recommended that clusters develop gateways for members to access ALANET from their central site computer systems. It is suggested that bibliographic utilities also develop gateways to this important library electronic mail system. (Chapter 10, p. 36, 2.1.2)

The Board of Library Commissioners will consider, on an annual basis, depending upon the availability of State funds, requests from libraries to join ALANET. Funding administered through the Board of Library Commissioners may only be used for initial start-up costs associated with joining ALANET; requests for the purchase of equipment, software, or a service which meets the needs of an individual institution will not be considered appropriate. Libraries participating in this program must agree to utilize ALANET for resource sharing purposes and must pay for all other costs for a period of not less than two years. (Chapter 10, p. 36, 2.1.2)

The document delivery mode chosen to fill a request should utilize the fastest, least expensive, and most reliable means of information transmission available. (Chapter 10, p. 37, 2.2)

Library consortia may request that the Board of Library Commissioners consider requests for funding, as available and appropriate, for pilot projects to demonstrate the applicability and functionality of telefacsimile for document delivery. Pilot projects cannot involve more than twenty-five percent of the consortia membership. Projects should be based upon the employment of an existing union list(s) to identify and locate requested items. Funds may be allocated for acquiring equipment only and cannot be utilized for operational, telecommunications and maintenance costs. Projects must run for no less than two years. Equipment must be returned in working order to the Board of Library Commissioners if the project operates for less than the two year period. Extensive cost and usage evaluations of the progress of the pilot project will be required. The Board of Library Commissioners will consider requests for funding to expand successful pilot projects after the pilot project has terminated and evaluative data has been submitted for review. (Chapter 10, p. 40, 2.2.1)

It is recommended that libraries desiring telefacsimile capability acquire CCITT Group III equipment with downgrade compatibility to at least Group II to be compatible with the facsimile being used in other libraries.

It is further recommended that Group IV standards be adopted as soon as

CCITT releases them, and that consideration be given to acquiring Group IV machines as economically feasible. (Chapter 11, p. 2)

In some resource sharing instances, such as inter-cluster resource sharing, fees for interlibrary loan may be imposed based upon cooperative arrangements because the frequency and need for continuous cooperation with each other and/or the materials to be loaned may not be appropriate without cost. The fees should be reasonable and reflect cost recovery or reimbursement. Additionally, it is recommended that the fees be assessed against individual libraries, not the cluster as an entity, unless agreed to in the cooperative agreement. Clusters and, for that matter, standalone systems should carefully consider the imposition of interlibrary loan fees, even on a cost recovery/reimbursement basis, when transacting among and between each other. A quid pro quo system of free interlibrary loan is desirable. (Chapter 12, p. 9)

It is recommended that the Board of Library Commissioners prepare legislation which would establish a state budget account for partial reimbursement to heavy interlibrary loan net lenders, excluding intra-cluster interlibrary loan. Secondly, it is recommended that the Board of Library Commissioners continue to seek a state budget account supporting the legislation passed in 1987 which enables partial reimbursement of public libraries with substantial circulation of materials to non-residents. (Chapter 12, p. 7; Chapter 14, pp. 1-2)

3. develop an ongoing education program on resource sharing

The Network Advisory Committee should conduct a continuing education needs assessment of issues related to resource sharing, identify potential providers, and coordinate an education program with those providers to increase the opportunities for librarians, trustees, library governing officials, and other administrators to become more familiar with automation and resource sharing activities. (Chapter 10, p. 41, 3.1)

Library consortia may request funding, as available and appropriate, from the Board of Library Commissioners to conduct educational programs about issues concerning resource sharing and/or automation. Such programs should be conducted without attendance fees for participants (costs for necessary materials for individual use, such as workbooks would be allowable). Further, the consortium should be able to reproduce the program on videotape and/or make the program available to remote sites using teleconferencing techniques. (Chapter 10, pp. 41-42, 3.2)

A library consortium may request funding, as available and appropriate, from the Board of Library Commissioners to conduct training and/or continuing education programs for its membership. Such programs should be of such content and scope as to be of interest and utility for other library consortia in the state, and should be available for dissemination via interlibrary loan at no charge. (Chapter 10, p. 42, 3.3)

The attached document "Automated Resource Sharing in Massachusetts: Activities, Functions and Policies Supporting the Long Range Program" is intended to provide a conceptual framework for the structuring and activities of a multitype resource sharing library network utilizing automated technologies. As a structure, the decentralized network is composed of independent units which serve as access points to the information resources of Massachusetts, New England, and the United States. These units, such as circulation/ILL (interlibrary loan) clusters and dial-up access libraries are themselves linked to one another through telecommunications, and through cooperative agreements.

The purpose of the network is to help library plans to locate, request, and receive information wanted by their patrons as efficiently and effectively as possible. Two assumptions are made. First, people have a need for all types of information located in all types of sources in all types of libraries. Second, libraries cannot be self-sufficient because they lack the financial resources and/or the physical space to acquire and store all the materials needed by their patrons to meet their needs. Resource sharing provides libraries with a means to meet those needs.

While it is important, and necessary, for all libraries to be resource sharers, it must be emphasized that resource sharing and interlibrary loan are not substitutes for provision of basic library services, and are not substitutes for local collection development. All libraries have a responsibility to provide basic services and to acquire materials needed regularly by their patrons. Resource sharing is intended to supplement basic library services. Libraries cannot and should not depend upon resource sharing to totally meet the needs of all of their users.

It must also be noted that not all libraries want, or have a need, to automate. Whether or not to automate a library function remains a local decision.

The "local library" referred to in the document denotes any type of library which is considered by the user to be his or her primary source. For example, an undergraduate student may consider the college's library as the local library. A technician's local library may be the collection of materials at the company. In most instances, the local library is capable of providing interlibrary loan services for its users.

The basis of the network is the development, continuation, and linking of machine-readable databases and physical access points into the information resources of the state's libraries. In its simplest form, an access point, such as a circulation control/ILL cluster or dial-up access library, identifies which library owns a desired item. Requesting and receiving that item may occur at the access point or through the user's local library. Not all libraries will become access points, although it is planned that such "non-access" libraries will have indirect access to informational resources through access libraries. In the network concept, access points utilize automated means to locate materials, ascertain availability status if possible, and request the items. In the future, delivery may become more automated as machine-readable formats evolve, and improved facsimile machines are introduced. The point is that the network's purpose is to locate information resources and provide for their sharing using automation as an effective and efficient process - a means to

an end. The network is not to become a bank of computers.

One of the most effective means of conducting interlibrary loan is by utilizing an automated, shared circulation/ILL control system. Turnaround time for document request and delivery can be reduced because requests are forwarded only to libraries known to own the item, and more likely forwarded only to those libraries with the item immediately available. Linking the circulation/ILL control systems using telecommunications and/or electronic mail or by disseminating copies of the cluster's database on optical discs enables a library in one cluster to search the holdings of another cluster, expanding resource sharing capabilities. A result will be less burden on current heavy lenders as more libraries participate in sharing resources.

However, not all libraries can participate in clusters because of financial and other constraints. Yet users of these libraries still have information needs, and it is prudent for their libraries to participate in resource sharing activities. As a partial solution, dial-up access libraries using microcomputers will be able to search the holdings files of circulation/ILL clusters to ascertain the location of requested items. Dial-up access libraries will also use a bibliographic utility or their affiliated cluster to create machine-readable records of their acquisitions. In this manner, the dial-up library is contributing its holdings to a machine-readable bibliographic database which can be accessed by other libraries searching for informational sources requested by their patrons. As a result, dial-up access libraries will be lending as well as borrowing materials.

The Regional Public Library Systems are mentioned throughout this document. It is important to note that although the three regional systems are established through the same legislative act, each is very different from the others. Each has established its own roles and services through the annual Plans of Service developed with the assistance of the Regional Advisory Councils (RACs) composed of representatives from member libraries. Further, each region administers its funding differently based upon an annual budget also developed with the assistance of the RACs. Because of these variances, it is impossible to generalize about regional services, roles and funding, and about the relationships between the regions and public libraries, non-public libraries, and the various resource sharing cooperatives and their activities, especially the clusters. The Regional Administrators want to remind readers, especially public librarians, that the appropriate procedure for introducing and implementing changes in regional services is through the annual Plans of Services.

This document is a revision and update of the automation plan approved by the Board of Library Commissioners in 1983 and is intended, among other things, to support the Long Range Program 1987 - 1991. Since that time, access points have increased in number, resource sharing activities have been modified, and technology has increased in its sophistication and, in many cases, decreased in cost. A revision was necessitated because of the changes in automated resource sharing over the past four years. For example, the 1983 plan included a microcomputer-based network component called the INC (Information Network Center). Its purpose was essentially the same as the dial-up access library. However, the INC's microcomputer was to be shared by two or more libraries. It was envisioned in 1982-3 that the initial cost of a microcomputer system at approximately $7,000 would increase, and many individual libraries would not be able to afford to acquire or maintain one on their own. That prediction was completely

wrong, and the concept of several libraries needing to share a microcomputer has been dropped. In another instarce, the 1983 plan rightly predicted that the economies and benefits for utilizing telefacsimile machines was in the future. The future is here, and so is the short term viability of facsimile as a component of document delivery.

This document provides the background information, concepts, activities, functions and policies necessary to support and supplement the relevant subgoals, objectives and tasks of the federal Library Services and Construction Act's Title I and Title III action plans of the Long Range Program, along with activities not currently included in that Program. This document does not replace the Long Range Program; rather, it provides the necessary information for the continuing development and revision of the Program, especially as the Program becomes broader to include objectives and activities not necessarily supported solely with federal funds.

Nearly every chapter of the 1983 plan has been revised (rewritten is more appropriate, but seldom do we read a work is "rewritten" rather than "revised"), a couple have been combined, a couple have been eliminated to keep the length of this document under that of War and Peace, and a couple of chapters added to clarify network activities such as "Telecommunications" and "Collection Development and Management". Another chapter, "Status of the 1983 Plan" explains what has happened since 1983, and, in some cases such as funding, since 1980. All of the old favorites are here including funding, standards, evaluation, activities, bibliographic conversion and, of course, the introduction.

This effort to rewrite (sorry, revise) the 1983 plan began shortly after its completion. The literature has been monitored continuously and gaps or problems with the 1983 plan were noted as they were pointed out or discovered. Late in 1985 it was decided by Board of Library Commissioners staff and the Network Advisory Committee to begin the revision. A time schedule was developed which would have completed the revision in the Summer of 1987. In May 1986, six "Town Meeting" style discussions occurred throughout the state to solicit what was wrong and right about the 1983 plan, and to receive an indication of what librarians expected from the revision. The meetings went smoothly and provided much useful input. Prior to beginning the additional research work necessary for the revision, State government introduced a library grants program for the Board of Library Commissioners to administer during fiscal year 1987 (July 1986 - June 1987). All projects and activities were dropped at that point to implement the grants program which was completed around December 1986. The time schedule for revising the 1983 automation plan could not be kept.

The Network Advisory Committee adopted a new time schedule in January 1987 which calls for the final draft of the revision to go before the Board of Library Commissioners in December 1987. In addition to the change in the completion schedule, the NAC delegated the writing of the first draft to the staff of the Board of Library Commissioners for reaction by membership in July 1987. The NAC membership reviewed the first draft and requested some revisions. The result of those revisions became the second draft which was sent out to all public and academic libraries, and select school, special and institutional libraries, approximately 582 in all. Six "Town Meetings" were held in September across the state to solicit reactions. Those revisions became the basis for the third draft which was reviewed and approved as amended by the Network Advisory Committee and the Statewide Advisory Council on Libraries in November 1987 prior to being

forwarded to the Board of Library Commissioners for action. On December 4, 1987, the Board of Library Commissioners voted to approve the document as revised so that "should" replaced "shall" or "must" in all appropriate instances.

Implementation of network activities and operations will take time. Furthermore, this document and the network are intended to be dynamic and must be continually reviewed, incorporating modifications, gained experience, and new theories and technologies. It is essential that this document be kept current to provide librarians in the state with a guide to the Board's concept of resource sharing and networking, and to update and support the Long Range Program 1987 - 1991. To meet that objective, it is proposed that this document be printed in a looseleaf "notebook" format. Individual chapters can be revised as necessary, and the revision sent to libraries for replacement in their notebooks.

The content of the document is necessarily choppy. To explain fully some of the technologies or concepts discussed would have increased its length by several hundred pages (probably surpassing War and Peace). Some readers suggested that the document be divided into several parts, such as separating the technical discussion into another publication, or eliminating some of the discussion which precedes a recommendation or activity. It was decided not to do either because the philosophical or technical discussion is needed to explain why an activity or recommendation is included.

Further, this document is not meant to be exhaustive on the subject and activities of resource sharing, and the writing style will not win a Pulitzer for literature. However, the document is intended as a starting place for librarians, trustees, library governing officials and other administrators to consider the concept and practicalities of automated resource sharing, and as a guide when questions concerning funding considerations arise. Again, it must be emphasized that this document is intended to be evolutionary and dynamic, to be reviewed and revised regularly. Several important issues, such as collection management and development, clarifying and defining roles and responsibilities, document request and delivery, and preservation of materials for resource sharing purposes are not yet fully developed and require additional study. Relevant aspects of this document will be revised as the issues are clarified and policies, procedures, and recommendations developed.

Trade names, and vendors and their products are mentioned throughout the document. In many instances the names are used for illustrative purposes only. However, in other instances, the names are used when the vendor's product is being specifically recommended to be used as, or in, an activity of the network.

The ALA Glossary of Library and Information Science edited by Heartsill Young (ALA, 1983) provides adequate definitions for many of the terms used. Readers who may want more in-depth information are directed to the footnotes and bibliography. Staff members of the Board will endeavor, as before, to maintain the currency of the bibliography.

1. WHY IS A RESOURCE SHARING NETWORK PROGRAM NEEDED?

People's need for information in our complex society is growing and becoming more obvious.[1] In a society that is becoming increasingly information dependent, there are few libraries, however well-funded and managed, that are capable of meeting all the information needs of their constituents.[2]

There is increased access to information for library users when libraries agree to cooperate with each other to share their resources. Resource sharing is no longer supplemental to local library operations, but has become a basic element. A network of resource sharing cooperatives would increase the effectiveness of locally-based efforts, particularly when founded upon use of automated technologies.

This document is intended to update and support the Long Range Program 1987 - 1991 and provide information and guidance for incorporating and developing resource sharing cooperatives and activities into a Massachusetts network which utilizes automated technologies to increase access to informational resources. Such a document and program is needed because:

- It is important for all libraries to share resources with other libraries of all types. There are many barriers to resource sharing; these barriers, however, could be reduced or eliminated by designing a network that not only increases access and sharing, but also allows for necessary local flexibility.

- A viable structure will increase the ability of libraries to locate and deliver needed materials to library users effectively and efficiently.

- Existing cooperatives are currently pursuing their own independent course. Guidance and coordination are essential or so much variation will develop that it will become increasingly difficult for the cooperatives to interact with each other. Coordination is particularly imperative in the application of bibliographic and communication standards.

- Coordination is also needed so that parity exists, as feasible, among cooperatives utilizing automation. This is particularly true for the clusters and union lists of serials projects.

- Cooperatives need to know what elements of an automated project are appropriate for funding administered by the Board of Library Commissioners, and the necessary requirements to be considered for such funding.

- Title III of the federal Library Services and Construction Act (LSCA) requires a resource sharing plan as a component of the Long Range Program, and of the annual Basic State Plan, both of which must be filed in order to receive funding.

- The Massachusetts Legislature, a potential source of funding for some aspects of the network, would need a plan prior to considering funding.

- Foundations and private sector corporations may be interested in assisting planned efforts designed to benefit members of the community at large and their employees in particular.

This document is a revision and update of the automated resource sharing plan approved by the Board of Library Commissioners in August 1983. A revision is necessary because of changes in technology and economics which provide the local library far greater flexibility in applying automated technologies than was envisioned in 1983 (such as the availability of inexpensive microcomputers). Further, with the additional experience gained over the past five years, many lessons have been learned which necessitated the inclusion or exclusion of activities related to, or caused by, the introduction and utilization of technology (such as online public access catalogs, telefacsimile, governance, funding, legislation, etc.) since the 1983 plan.

This document is necessary as an explanation for libraries and librarians wondering how the application of automated technologies can benefit them even if their libraries are not automated. As a simple answer, a network based upon independent cooperatives of libraries communicating with each other appears to be a good environment for automated resource sharing. The decentralized network structure is theoretically designed so that any library will have access to the resources of other libraries within two steps of the request. For example, if Library A (not automated) requests an interlibrary loan from Library B (first step), Library B will either be a participant in a cooperative which is a network component, or can forward the request to Library C (second level) which is a participant in a network cooperative. Although only theory at this time, it is an objective of this document that any library in the Commonwealth have such access to the resources of network participants. This will apparently work for most public, academic, school and special libraries if, at a minimum, a local municipal public library is involved in the process as "Library B" because of the participation of the Regional Public Library Systems as one of the components of the network.

This structure implies that a library need not automate to take advantage of some of the benefits of automation. It is understood that not all libraries have a need or desire to automate. Such a decision is, and will remain, a local decision. However, it is hoped that librarians and others responsible for library administration, governance and policy will gain some insight from this document and from exploring the sources included in the bibliography of why many libraries choose to automate.

ENDNOTES

1. National Commission on Libraries and Information Science, Library and Information Service Needs, p. 268.
2. David Boals, "Interlibrary Loan Networks," pp. 124-5.

2. STATUS OF THE 1983 PLAN

The document entitled Automated Resource Sharing in Massachusetts: A Plan was approved by the Board of Library Commissioners on August 11, 1983. Several recommendations included in the Plan are reviewed here in a discussion of what has occurred in automated resource sharing as related to the Board of Library Commissioners. Discussion will include some of the successes and failures of the 1983 Plan, and some areas in need of revision which is one of the reasons for the development of this document. Readers are reminded that the following comments do not constitute a formal evaluation.

Recommendation I: A multitype library resource sharing network based upon automated technologies should be implemented. The network will be hierarchical in that cooperative centers will communicate with other centers in a planned outward and upward process. All network services should be provided at a level of operation as close to the user as possible, and through local libraries as often as possible.

Comment: This is a broad recommendation that will take years to fully implement Libraries of various types make up the components of the network - clusters, serial projects, etc. However, a hierarchical network has not evolved, and will not. The numerous independent components cannot be organized into a hierarchical structure, and automation provides each library cooperative with the ability and flexibility of establishing horizontal relationships as their needs dictate based upon a decentralized structure for interlibrary communication and resource sharing. This last aspect, that of providing the service as close to the user as possible, has been successful. With the growth in membership of the clusters, the use of microcomputers as a means of dial-up access to cluster databases for resource sharing, and the awareness that automation is a viable means to an end to improve user services, the local library is serving as the primary point for providing network-related services.

Recommendation II: The Mission Statement and Statement of Related Activities of the automated resource sharing library network for Massachusetts should be adopted:

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

Comment: The Board of Library Commissioners has encouraged the development of library cooperatives and the application, as appropriate, of automated technologies to dramatically increase access to the information resources of libraries in Massachusetts. Such an effort has improved interlibrary resource sharing.

The Board has also been successful in reducing barriers to resource sharing efforts. Most libraries have indicated that the lack of funding was the most prevalent barrier to their participation in resource sharing cooperatives. Through the Board's program of funding capital costs associated with cooperation such as establishing clusters using automated circulation/ILL control systems, the conversion of serial holdings into machine-readable form, and

providing microcomputers for libraries to access cluster and other bibliographic and reference/source databases, the Board has provided the means for many libraries to participate in cooperative efforts they could not have afforded by applying only their local resources.

Recommendation III: Develop and link bibliographic databases to provide greater access opportunities to resources.

Comment: Since 1980, the Board of Library Commissioners has expended $2,226,959 of state and federal funds through January 1, 1988 for bibliographic control and to develop bibliographic databases for resource sharing purposes. This includes funding for cooperative cataloging, conversion projects, equipment for bibliographic control, and pilot bibliographic projects involving collection analysis and the application of CD ROM technology.

Project	LSCA	State	Total
Eastern Mass. Regional Library System	$ 256,420	$	$ 256,420
Worcester Area Cooperating Libraries	42,083		42,083
Boston Public Library	568,000		568,000
Metro Boston Library Network		620,000	620,000
Automated Bristol Library Exchange		50,016	50,016
Boston Library Consortium		99,519	99,519
C/W MARS		332,985	332,985
Old Colony Library Network		35,000	35,000
Minuteman Library Network		135,957	135,957
Cape and Islands Inter-Library Cooperative		41,979	41,979
Southeastern Automated Libraries		45,000	45,000
TOTALS	$ 866,503	$1,360,456	$2,226,959

Funds have also been expended specifically to develop databases for union lists of serials projects. Since 1980, through January 1, 1988, $359,484 of state and federal funds have been expended on bibliographic databases for serial projects.

Project	LSCA	State	Total
Eastern Mass. Regional Library System	$ 7,500	$	$ 7,500
Boston Library Consortium	78,083		78,083
Fenway Library Consortium	40,668		40,668
Essex County Cooperating Libraries/Merrimack Inter-Library Consortium	51,190		51,190
Worcester Area Cooperating Libraries	29,000	1,500	30,500
WELEXACOL	21,158		21,158
Southeastern Mass. Cooperating Libraries	64,674		64,674

Cape and Islands Inter-Library Association	29,351	9,761	39,112
Cooperating Libraries of Greater Springfield	26,599		26,599
TOTALS	$ 348,223	$ 11,261	$ 359,484

Recommendation IV: Develop access points into the information resource.

1. expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed.

Comment: Much of the Board of Library Commissioners' effort in expanding the number of access points into the informational resources of our libraries has involved the establishment and expansion of shared circulation/ILL control systems, commonly known as "clusters." It is difficult, if not impossible, to know how many libraries are involved in cluster activities because of the various levels of cluster membership possible. Libraries which use the circulation module or are converting their collections via leased lines are considered full members. Other libraries accessing the clusters on a dial-up basis are usually referred to as "associate" or "dial-up" or "micro" members. It is estimated that on January 1, 1988 there were 293 libraries of various types in various membership categories affiliated with the clusters:

199 public libraries
24 private academic libraries
15 public academic libraries
51 special libraries
4 school libraries

Public libraries affiliated with the clusters as either full or dial-up members served a total municipal population exceeding 4,682,245 residents, or nearly 82% of the state's population. Existing clusters expect to have a total of nearly 12 million items in their databases representing a statewide total of nearly four million titles. Support with state and federal funds administered through the Board of Library Commissioners for establishing and/or expanding the clusters' central site hardware and software from 1980 through January 1, 1988 totals over $8.5 million (these figures do not include conversion, telecommunications, planning and training, and the libraries using microcomputers to access the database).

Project	LSCA	State	Total
NOBLE	$ 710,600	$ 272,065	$ 982,665
C/W MARS	1,111,579		1,111,579
Merrimack Valley Library Consortium	360,182	305,056	665,238
Minuteman Library Network	883,250		883,250
Old Colony Library Network	550,000	150,000	700,000
Automated Bristol Library Exchange	281,623	40,190	321,813
ULowell Collaborative	193,815		193,815

Metro Boston Library Network	719,000	784,189	1,503,189
F. L. Olmsted (Fenway)	720,226		720,226
Cape and Islands Inter-Library Association	686,000	166,000	852,000
Southeastern Automated Libraries	625,000		625,000
TOTALS	$6,841,275	$1,717,500	$8,558,775

Recommendation IV: continues

2. develop Information Network Centers (INCs) to serve as access points into the total information resource by providing INCs with the capacity of utilizing search, cataloging/ILL, and circulation/ILL services.

Comment: One Information Network Center was federally-funded for $18,359 in 1985. Three communities participated - Bridgewater, which also served as the INC's central site, West Bridgewater and East Bridgewater. The project itself was successful in that it carried out all of its objectives and activities. However, the Information Network Center was flawed in concept. The INC concept is not included in this document.

The failure of the INC concept is easily attributed to the economics and technology of the microcomputer. In 1982 when the INC concept was envisioned, it was thought that the price of a microcomputer (estimated at over $7,000 with a ten megabyte hard drive, a decent dot matrix printer, and software) would be too expensive for a small library to acquire and maintain on its own. With high inflation, the price of microcomputer technology was only going to increase. Many small libraries would have to share a microcomputer in order to afford it.

As everyone knows by now, the prices for microcomputer technology fell faster than could be imagined. A $7,000 IBM microcomputer configuration became available at less than half that price. With the costs low and the promises of increased productivity appearing in every newspaper ad, on every television screen and at every library conference, libraries began to acquire microcomputers with operational funds or through donations from the Friends of the Library and other civic groups. Therefore, there was no need to share a microcomputer if the library could own one. The INC concept was not attractive.

However, the INC functions were still important. Libraries needed access to the cluster's databases to facilitate interlibrary loan. Further, libraries needed to convert their ongoing acquisitions into machine-readable form by matching records against an existing database on a bibliographic utility or a cluster's computer system. Librarians also needed to become familiar with the searching capabilities and databases offered by the information retrieval systems. The need was there - the concept of two or more libraries sharing microcomputer equipment was unrealistic.

The Western and Central Regional Public Library systems began a program in which member libraries could receive financial

assistance from the region for the purchase of a microcomputer to access the C/W MARS database. In fiscal years 1987 and 1988, the State Legislature included funds for a library competitive grant round for the Board of Library Commissioners to administer. A program was developed to provide public libraries with funds to acquire the necessary microcomputer hardware and software to access the cluster databases. Libraries receiving grants would also use the microcomputer as a means to convert their ongoing acquisitions into machine-readable form through a bibliographic utility or a cluster's bibliographic database.

Sixty libraries were awarded microcomputers in the FY1987 and FY1988 state competitive grant rounds totaling $236,167. Two clusters, ABLE (Automated Bristol Library Exchange) and the Minuteman Library Network received $4,302 in FY1987 state funding for modems and toll-free telephone lines to support the dial-up microcomputer libraries. Additional telecommunications costs were funded through a state-funded account in the Board's FY1987 and FY1988 budgets. Funds were also provided to the regional public library systems for training librarians on the using the microcomputers ($60,250).

The microcomputer projects will continue as long as the demand and availability of funds continue. State competitive grant funds have also been awarded to public libraries wishing to acquire a microcomputer and software to introduce search services (called reference/source services in this second plan) to their constituents. Therefore, the functions of the Information Network Center exist, but the concept of two or more libraries sharing access to a microcomputer has been abandoned.

Recommendation V: Develop telecommunications linkages between circulation-/ILL clusters and between INCs and clusters to expand the scope of resources available for accessing and sharing. Linkages between disparate systems should be explored and developed.

Comment: Telecommunications between the various components of the network (within clusters, between clusters, and between individual libraries with dial-up access and the clusters) is one of the most important issues concerning automated resource sharing. Intra-cluster telecommunications (telecommunications between the remote library and the cluster central site) tends to be the most costly of the annual operating costs associated with resource sharing. In addition, telecommunication costs between the dial-up library and the cluster central site can be costly on an hourly basis during normal business hours. Further, although the clusters can generally meet about 80% to 90% of their needs within the clusters, telecommunications between clusters to search bibliographic databases dramatically increases the potential for finding a desired item and immediately determining its availability status. However, the telecommunications costs of inter-cluster communications must be taken into consideration along with the technical difficulties of linking disparate computer systems in order to communicate at all.

In 1985 the Board of Library Commissioners administered an $80,000 federally-funded grant to facilitate telecommunications between clusters, and between dial-up libraries and clusters. Funds were provided to the three clusters using the CLSI circulation control

system for computer-to-computer telecommunications so that a member of one of the clusters could utilize their central site computer to access the bibliographic database of another cluster. Funds were also provided to C/W MARS so that public libraries with microcomputers could access the database. Nearly half of the grant funds were expended for a study of the cluster' telecommunications systems and to develop a procedures manual for inter-cluster communications.

As part of the Board of Library Commissioners' fiscal year 1987 and 1988 state budgets, the Legislature provided $200,000 each year for telecommunications support related to cluster activities. Funds were used to continue support of the toll-free lines for dial-up libraries to search the clusters' databases for interlibrary loan purposes, and to maintain a telephone line for inter-cluster telecommunications among the three CLSI clusters. The balance of the funding was used to partially reimburse the clusters for costs associated with remote library to host site telecommunications.

Funds from the FY1988 state competitive grant round were applied toward upgrading or installing telecommunications equipment for the clusters. A study of the existing and/or planned telecommunications configurations of the clusters was completed in early 1987. Using the data provided by the study, several clusters applied for and received funding for central site telecommunications equipment and/or equipment which was shared by at least two remote libraries. The Minuteman Library Network grants included equipment for testing an X.25 PAD to connect with UTLAS, and a pilot project using radio modems in a bookmobile to telecommunicate with the central site.

Project	LSCA	State	Total
NOBLE	$	$ 220,750	$ 220,750
C/W MARS		200,000	200,000
Merrimack Valley Library Consortium		217,940	217,940
Minuteman Library Network		17,570	17,570
Metro Boston Library Network		107,610	107,610
Cape and Islands Inter-Library Association		73,475	73,475
Southeastern Automated Libraries		93,220	93,220
TOTALS	$ 0	$ 930,565	$ 930,565

During the past three years, the Board of Library Commissioners has funded two projects designed to expand the resource sharing effort by linking or accessing the numerous disparate circulation/ILL computer systems. First, a total of $46,500 of federal funds was expended on developing and implementing a concept to link disparate systems by establishing a canonical language betwee.. different operating systems which, when implemented, would be transparent to the user.

This pilot project was a failure. First, it did not meet the specifications developed by the Library of Congress-hosted Linked Systems Project which resulted in published and verbal criticism from LC's Network Development Office. The disparate link designer (LSSI, Inc. of Maryland), a value-added marketer of the Library of Congress

MARC database, could not afford to run afoul of the primary source on which the business was based. Furthermore, the implementation ran into serious scheduling problems as hardware and software continually failed to function properly. The project was abandoned in 1986.

A far less ambitious project to access disparate systems was funded for $10,800 through the FY1987 state competitive grant round. The Pollard Memorial Library in Lowell, a member of the Merrimack Valley Library Consortium (a CLSI cluster) purchased terminals for their library to access the University of Lowell's Data Research Associates' ATLAS circulation system.

Other efforts have been made to study the problem of linking disparate systems. In early 1987, IBM looked at the need for the disparate Massachusetts clusters to communicate with one another, and proposed a solution. Dependent upon the numerous circulation system vendors agreeing to cooperate, the IBM proposal included a front-end processor at each cluster tied into a "switch" which would translate each vendor's transactions into a common language. This concept is similar to the project funded by the Board with LSSI, and vendors have not shown an eagerness to develop or adopt a standard language. The telecommunications study mentioned earlier also examined the issues involving inter-cluster linkages, and concluded that a private circuit-switched system could be implemented for telecommunications. However, data communications would remain a problem due to the differences between cluster operating systems, screen mapping, and the numerous standards employed.

Linkage of disparate systems is important to the expansion of the resource sharing effort in Massachusetts. It is hoped that a computer or library vendor will develop an LSP-approved linkage in the near future so that it can be implemented within the State.

Recommendation VI: Develop interfaces between circulation/ILL control systems and cataloging utilities to ensure that the circulation/ILL system's database of bibliographic records is as current as possible for searching from other access points.

Comment: Three interfaces have been developed since the first plan was approved. Boston Public Library and the Eastern Mass. Regional Library System applied $50,000 in regional funds to develop an interface between the bibliographic system used by the Boston Public Library and those clusters using the CLSI circulation control system. Federal funds have been used to develop an interface between the Minuteman Library Network's CLSI circulation system and the UTLAS bibliographic utility in Toronto, Canada. NOBLE improved upon an existing interface between a CLSI system and OCLC which allows NOBLE members libraries to share interface hardware remotely. Prior to this improvement, a library needed to have the interface hardware locally which meant that each library requiring the interface needed its own hardware.

Recommendation VII: Develop document request and delivery procedures.

a. Use electronic means to identify library holdings and to transmit requests whenever possible.
b. Document delivery should utilize the fastest, cheapest and most reliable means possible.

Comment: This recommendation has had limited success in its implementation. Intra-cluster electronic identification of holdings and availability status is expected from the circulation/ILL control system. Inter-cluster identification of holdings has been less successful - libraries using the OCLC system can electronically search each others' databases. However, there is little searching between disparate systems because of technological barriers.

Libraries using OCLC as a bibliographic utility have had few problems, if any, electronically identifying library holdings and transmitting requests. Until 1986, most users of the Boston Public Library cataloging system could neither electronically identify holdings nor transmit requests.

There has been less success in the ability of cluster members to electronically transmit requests. In many instances, the circulation/ILL control system lacks adequate electronic messageing capability. For example, users of OCLC systems must establish "dummy" title records for electronic messages because of the lack of the capability on the system. In other situations, electronic messageing is little used. However, those clusters which have access to electronic messageing when the system is installed have easily adopted the procedures into their work flow, increasing productivity and the effectiveness of resource sharing in a cluster environment. Libraries using microcomputers to access cluster databases can electronically locate library holdings, but their ability to electronically transmit an interlibrary loan request is limited to the cluster system's capabilities.

Even more frustrating than the lack of electronic identification of library holdings and the ability to transmit a request is the delivery of requested items. Although the clusters and the bibliographic utilities have the technology to locate holdings information in seconds, and the clusters can determine availability status immediately, the delivery of materials is still painstakingly slow.

Massachusetts attempted to facilitate document delivery among libraries of all types when it successfully sponsored legislation in 1985 enabling the regional public libraries to share their existing document delivery systems with non-public libraries. Eastern Region has implemented a pilot document delivery project involving several non-public libraries, and received $5,000 of FY1987 state competitive grant funds to further study regional document delivery. Boston Public Library received $57,000 in an FY1988 state competitive grant for a pilot telefacsimile project among members of the Boston sub-region.

Most inter-public library material continues to be moved through the regional document delivery systems. Most intertype library document delivery continues to be moved by mail. A few library cooperatives operate a courier service for document delivery. Document delivery will continue to "appear slow" compared to the identification process as long as the item is sent without utilizing electronic means. The implementation of telefacsimile, not discussed at length in the 1983 plan, may become a component of the solution.

Recommendation VIII: Develop a program of computer literacy/training for

librarians who are without direct access to computerized network systems.

Comment: This objective has not been successful if taken literally. A "program" was not developed specifically for computer literacy and training. However, training programs and planning projects have increased the awareness and understanding of automation as a means to an end for increased productivity in library operations, resource sharing, and improved services for patrons.

The Board of Library Commissioners has, since 1980, funded six grants for groups of libraries planning resource sharing projects. Most of these projects have lead to the establishment of a resource sharing cluster based upon the application of automated circulation control technology.

Projects	LSCA	State	Total
Central/Western Regional Public Library Systems	$ 25,000	$	$ 25,000
Fenway Library Consortium	15,050		15,050
Southeastern Mass. Cooperating Libraries	35,200		35,200
New Bedford (Southeastern Ma. Automated Resources & Telecommunication Systems)	45,000		45,000
Cape and Islands Interlibrary Association	40,000		40,000
Metro Boston Library Network		30,000	30,000
TOTALS	$ 160,250	$ 30,000	$ 190,250

Three grants have been made specifically for automation training for librarians. Shortly after receiving its planning grant, the Central and Western Regional systems received $5,000 of federal funds for automation training for member libraries. More recently, $60,250 of FY1987 and FY1988 state competitive grant funds were provided to the regional public library systems for training librarians receiving grants to purchase microcomputers in order to access cluster bibliographic databases for resource sharing.

Recommendation IX: The Board of Library Commissioners should support resource sharing activities in the State by providing state and federal funds for developing access points as appropriate and feasible. In addition, the Board should seek state funds to assist in the costs of telecommunications.

Comment: As discussed above, the Board of Library Commissioners has embarked on a very active program to increase access points for resource sharing. Further, the Board has been successful in securing $400,000 of State funds for cluster-related telecommunications costs in FY1987 and FY1988. To summarize, funds have been allocated since 1980 through January 1, 1988 as follows:

Project	LSCA	State	Total
bibliographic control &			

developing bibliographic databases (conversion)	$ 866,503	$1,360,456	$2,226,959
union lists of serials	348,223	11,261	359,484
establishing and/or expanding clusters	6,841,275	1,717,500	8,558,775
microcomputer access for resource sharing	18,359	240,469	258,828
telecommunications	80,000	1,330,565	1,410,565
linking disparate systems	46,500	10,800	57,300
developing bibliographic interfaces	*	50,000	50,000
document delivery	0	62,000	62,000
planning and training	165,250	90,250	255,500
TOTALS	$8,366,110	$4,873,301	$13,239,411

* these costs were included in the figures reported under "establishing and/or expanding clusters"

Recommendation X: In order to facilitate resource sharing in the Commonwealth, cooperating groups of libraries receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should agree to:

1. Provide at least five percent of their system ports, but not fewer than three ports, for telecommunications links from other access points in the State. At least one of the ports should be provided for dial-up access, and a toll-free line is desirable.

Comment: This has been implemented through the contracts between the cluster and the Board of Library Commissioners. However, several of the clusters have allocated the ports for member use without the prior permission of the Board.

Recommendation X: continues

2. Install a circulation/ILL control system that can support the U. S. MARC format, data content and rules of AACR2, and authority control.

Comment: Many of the Massachusetts clusters have accomplished this, except for the clusters with CLSi as their vendor. Those clusters initially installed a system which could not support the U.S. MARC record, but system revisions now support the format. This recommendation will be revised in this document, requiring all circulation systems to accept, retain and output the U.S. MARC record format as well as support its use.

Recommendation X: continues

3. Adopt a bibliographic record structure developed with the Board of Library Commissioners.

Comment: The intent of this requirement was that Board staff would actively participate with the clusters in establishing bibliographic format so that database compatibility communications issues among clusters would be minimized in the future. In most

instances, the format was not formally discussed or developed with Board staff.

Recommendation X: continues

4. Provide free reciprocal borrowing and/or interlibrary loan among members of the cluster.

Comment: All clusters have agreed to this in their cluster governance and procedures.

Recommendation X: continues

5. Have their bylaws approved as to form by Board staff.

Comment: All clusters have complied with this requirement.

Recommendation X: continues

6. Allow other network participants to copy, at the other group's cost, the database of bibliographic records (as specified in the contract) to assist in the conversion of records from manual format to a machine-readable format.

Comment: This was included in the contract between the Board of Library Commissioners and the cluster. No cluster has taken advantage of this database source.

Recommendation X: continues

7. Participate in the State's resource sharing network.

8. Incorporate as a nonprofit, non-stock, membership corporation under Massachusetts laws.

Comment: All clusters have complied with these requirements.

Recommendation XI: Technical and cooperative agreements should be established between circulation/ILL clusters, and between Information Network Centers (INCs) and clusters, defining such areas as fees, scope and level of cooperation, responsibilities, communications protocols, document request and delivery procedures, and others.

Comment: Such agreements, when necessary, have been established. Aspects of the agreement between the Information Network Center and the Minuteman Library Network laid the basis for the agreements between the libraries using a microcomputer for dial-up access and the cluster.

Recommendation XII: The Board of Library Commissioners should monitor and participate in the development and implementation of the statewide network proposed by the Massachusetts Corporation for Educational Telecommunications.

Comment: The Board monitored MCET's development and activity. However, MCET did not develop a statewide network as envisioned in 1983, but a network based upon cable television and their related satellite links for educational audio-visual programming. In late 1987, MCET began to

explore establishing a statewide network for telecommunications.

Recommendation XIII: Amend existing legislation to allow the Regional Public Library Systems to provide document delivery and retrieval to network participants that are not public libraries.

Comment: This legislation was signed into law in 1985.

Recommendation XIV: File legislation to create quasi-governmental data processing entities for the exclusive use of various types of libraries.

Comment: This legislation was filed twice, and failed to win approval. Members of the library community were opposed to the legislation so support was essentially non-existent. Although several Town and City Counsels state that there is a need for this legislation because the non-profit organizational structure established under Massachusetts General Laws Chapter 180 is inappropriate when municipal entities and departments are involved, the Board of Library Commissioners has voted not to file the legislation without the needed support of the library community.

Recommendation XV: File legislation and/or receive special status from the telephone rate-setting Department of Public Utilities that would establish a lower telecommunications "library network rate" for participants.

Comment: No legislation was filed based upon advice from the Department of Public Utilities. DPU thought the legislation was not likely to pass, and that it would be difficult to get a lower rate for libraries when other non-profit and educational networks were involved in similar, telecommunications-oriented activities. Department members advised seeking state funds to offset telecommunications operating costs.

Recommendation XVI: Amend existing legislation to include the Director of the Board of Library Commissioners as an ex-officio, voting member of the Board of Directors of the Massachusetts Corporation for Educational Telecommunications.

Comment: The original legislation as filed by State Administration on behalf of MCET did not include the Director of the Board of Library Commissioners on MCET's Board. For two years after MCET was established, the Board of Library Commissioners actively sought to amend the legislation to include the Board's Director. In 1987, legislation that included a representative from the Board of Library Commissioners on MCET's Advisory Council was filed and passed.

Recommendation XVII: The Board of Library Commissioners should establish the Network Advisory Committee charged with providing advice, submitting reports and recommendations, and providing evaluations to the Board concerning network activities.

Comment: The Board of Library Commissioners established the Network Advisory Committee in November, 1983. Since that time the NAC has twice reorganized while seeking the most effective structure to meet its membership-defined mission and objectives. The NAC is one of the most important organizations in the Massachusetts library community. It is one of the few organizations which serves as an issues forum for

libraries of all types to discuss common library concerns and interlibrary cooperation.

Recommendation XVIII: The Board of Library Commissioners should coordinate, with the Network Advisory Committee, a public information program about the network for state residents and librarians.

Comment: This has not been implemented for several reasons. First, public relations is a time consuming activity and the members of the NAC have little time from their regular activities to administer such an effort. Secondly, such an effort seems premature while the network components are still in development. Third, public relations requires other resources in addition to personnel, and funds have been utilized toward components of the network and not toward publicizing network activities. When more of the network components are in place and operating, a serious, well-funded public relations program will be needed to increase the awareness of our state's residents about the improved access to the rich informational resources of Massachusetts libraries.

User Needs

People need information contributing to survival and success in living. The need for information has always existed, but now, in a complex society, it is ever-increasing. Life information needs range from survival (general life maintenance - food, clothing, jobs, housing, personal care and safety, social and emotional integration) to self-enrichment and growth (information needs relating to recreation and leisure, education, and self-actualization).[1]

Users are individuals, each with unique informational, educational, psychological, and social needs. A person may need practical knowledge to solve immediate problems in his daily life and work. There may be a need for professional knowledge to further continuing education. Or there may be a need for intellectual knowledge, the kind that furthers understanding of the arts, humanities, and sciences, and which enriches the individual's personal life. In addition, people feel the need for ethical, religious and philosophical insights.[2]

Organizations, like individuals, need information and knowledge. Business organizations need facts and data to forecast a market, develop a new product, or adapt a new technology. Schools need information to improve and extend the learning process. Research organizations need information to synthesize new data with known facts as part of the creative process. Government needs information at every level to formulate plans, refine decision-making, and help government workers to anticipate and resolve problems.[3]

The quest for information is not a new phenomenon. Information has been needed and used by persons throughout the ages for there has never been a time when people did not need information to solve problems.[4]

However, this need for information has become more important over the past thirty years. First, society has become more and more complex as it has evolved. Today it is in a constant state of flux caused by changes which come too rapidly to be assimilated into an individual's life. For example we are able, through the media, to witness events throughout the world as they occur. The scientific revolution of this century has made it possible to improve the quality of our lives, and to destroy it. Medical advances has made it possible for people to live longer.[5]

In such a changing and complex society, formerly simple solutions to information needs become complicated. Many of life's problems are beyond the capacity of the extended family to resolve.[6]

In addition to societal changes, today there is an enormous stockpile of information. This information explosion is expected to continue, creating new information at an annual increase of 12.5% during the 1980s. Thus, the individual has more information available today than any generation, and the task of finding that one piece of information relevant to his or her specific problem is intricate, time-consuming and sometimes overwhelming.[7]

What type of information are users seeking? A New England study of information seeking patterns conducted in 1979 (Chen) concluded that 73% of

the information needs of people over 16 years old related to the theme of "meeting personal needs." Aspects included information to serve in coping with day to day problems, trauma, or crisis; news and current events; supporting interest in cultural heritage, religion, and family life; and accommodating needs in entertainment, recreation, and leisure activities. The only other theme to generate wide interest was "improving organizations and professions" including information to meet needs of the work place. Issues in the "enhancing lifelong learning" (support education in schools, erase illiteracy and improve reading skills of the public) and "effectively governing society" (increase citizen participation in public policy decisions, government needs for census, economic, and other related information) categories accounted for 7% of the people's information needs.[8]

Unfortunately, the traditional, book-oriented library can no longer meet the information needs of its patrons. The distribution of knowledge and information relevant to all aspects of an individual's life span requires:

1. the ability to find the location of the information and/or material in a timely manner both within and beyond the local library collection, and
2. the receipt of the right amount of information and/or material in the most efficient mode possible once the individual's need is determined.[9]

Libraries are not a major supplier of the information which meets the needs of citizens. The 1979 study previously mentioned discovered that New Englanders were most likely to draw upon "interpersonal sources" of information including personal experiences, friends, relations, and co-workers. Libraries were consulted as a possible source of information only 17% of the time when a need for information became evident. This meant that among institutional sources libraries ranked fourth behind businesses at 45%, professionals (doctors and lawyers) at 41%, and government agencies at 27% and ahead only of social agencies (13%) and religious leaders (10%).[10]

Fifty-one percent of those respording in the Chen study who did not use libraries as a source of information stated that it was because they did not need libraries, did not think libraries could help, or had enough information from other sources. Another 10% said it did not occur to them to consult a library. Libraries were most often used as a source of information in situations dealing with consumer issues, getting/changing jobs, and education and schooling.[11] Similar results to that of the New England study were also reached in a 1985 Connecticut study.[12]

Two recent user studies were conducted in Massachusetts. Public libraries participating in the ABLE (Automated Bristol Library Exchange) cluster found in a 1984 survey that 42% of the respondents never utilize the public library because they believe it cannot meet any of their needs and/or because they are too busy. Seventy-six percent never consult the library at all when they need information. At least 20% assume the library cannot meet their needs for information and 14% of the patrons do not believe it is worth the effort to phone the library for information. To the respondent, an informal network of friends, associates, local merchants and others took precedence over the library. The study found that the library was not a principal source of information.[13]

Libraries on Cape Cod conducted a user survey during 1985. Over 40% of the respondents did not use their local public library. Non-users stated that they buy their own books (33%), have no time (25%), or use another library (16%). Nearly 10% of the respondents stated that the library did not have the materials they wanted while over 5% had no need for the library.[14]

Traditionally, libraries have been oriented more toward building their collections than toward developing and using those collections to meet the specific needs of a person. In most cases, libraries have been geared to serve the "average user."[15] Furthermore, libraries have always reflected certain assumptions about users. Despite studies which have pointed out several factors to the contrary, library practices continue to reflect these same assumptions:

1. "Patrons will turn to the library when they need something"

   . . . From the New England study it is obvious that people infrequently (only 17% of the time) think of the library as a possible source for their information needs.

2. "They will be willing to wait for an item for varying amounts of time"

   . . . They are usually unwilling to wait for material and therefore do not even come to the library but consult someone they know and get what they need quickly.

3. "They know what they want"

   . . . They may know approximately what they want but do not always realize what is available to them in addition to the sources, usually "interpersonal," known to them. Thus, they can miss a wealth of pertinent information through lack of source identification.

4. "They are able to describe what they want adequately"

   . . . Probably not, as any reference librarian can relate.[16]

Library Needs

Many local library facilities and procedures designed for other times and conditions can no longer cope with the ever-increasing volume of information produced - nor can they fully satisfy the rapidly-changing information needs of our society. The problems facing libraries include:

1. the increased cost of acquiring library materials and organizing them for use
2. the difficulty of recruiting and compensating skilled personnel for these tasks, especially when the range of languages, subjects, and services is great
3. the growth of knowledge, with the consequent demands, particularly on academic libraries, for a wide range of specialized materials
4. the varying levels of resources and funding abilities for each library
5. the cost of storing infrequently-used materials that accumulate

when a library tries to be self-sufficient

6. the requirement to serve constituencies that are not being served[17]

During the development of the Board of Library Commissioners' Long Range Program in 1986. members of the various Task Groups identified the need to survey the Commonwealth's libraries to assess what a library perceived it needs to meet its mission and to support its numerous roles.

It was decided to use a modified Delphi approach in assessing library needs. On the first survey. librarians were asked to identify five needs (not in priority order) of their local library. It was emphasized in the instrument that library needs, not user needs, were being assessed. As responses to the first survey were compiled, duplicate and inappropriate responses (those which identified user needs) were eliminated resulting in 51 issues included in 39 statements.

The 39 statements became the basis of the second survey which was sent only to those librarians responding to the first survey. After each of the 51 issues, the survey participants were asked to rank their responses from 1 to 10 with 10 being the highest priority. Rankings were entered into a computer database and an arithmetic means for responses calculated. The resulting arithmetic means are seen as a measure of perception of how librarians from special. academic and public libraries prioritized issues identified in the first survey.

Statistics for the participants are as follows:

Type of Library	Total Population	Responded to the first part of the survey	Continued the process by responding to the second part of survey	Cumulative response of entire population through the process
Public	383	147(38.4%)	132(89.8%)	34.5%
Academic	90	32 (35.6%)	29 (90.6%)	32.2%
Special	418	75 (17.9%)	50 (66.7%)	12.0%
TOTALS	891	254 (28.5%)	211 (83.1%)	23.7%

The complete results of the survey are too long to include in this document. However, the ten highest ranked priorities of public, academic and special libraries follows.

Please note: Respondents ranked the questions by assigning a value of 1 through 10, one being the least important, ten being the most important. The questions appear in the same order as on the survey instrument, followed by the statistical mean and ranking (out of 51, one being the highest). Ranking of ties in statistical means was determined by summing the ranks and dividing by n.

Survey Question and Number	Public Libraries	Academic Libraries	Special Libraries
3. improve professional, non-professional and support staff salaries and benefits	8.030 (1)		7.360 (1)
8. develop a coordinated statewide public relations campaign to improve the image of the library and of librarians to constituents			6.620 (8)
13. make an effort to establish and/or increase funding for:			
b. library construction, additions and renovations	7.697 (3)		
g. automated resource sharing	7.470 (4)	8.345 (1)	5.960 (4)
h. retrospective conversion of collections		7.724 (3)	
i. telecommunications costs	7.106 (5)	7.655 (4)	
k. document delivery systems		8.276 (2)	
l. preservation of materials		6.966 (10)	
m. library employees to pursue a graduate library degree and/or for professional to continue their education			6.560 (9)
15. link the various automated circulation control systems (clusters) to each other to facilitate resource sharing	6.924 (6)	7.586 (5)	
18. complete development of consortia union list of serials and then merge those into one statewide union listing		7.172 (8)	7.040 (3)
20. increase interlibrary access to the databases of shared circulation control systems (clusters)	6.864 (7)		

25.	Increase the opportunities for continuing education for professional and non-professional librarians	6.848 (8.5)		6.920 (5)
32.	develop a coordinated statewide interlibrary loan network	6.780 (10)	7.103 (9)	6.460 (10)
33.	improve coordination and cooperation between all types of libraries			7.260 (2)
34.	hold geographically-based information gathering and sharing meetings including all types of libraries			6.700 (7)
35.	expand and improve document delivery between all types of libraries through the regional public library systems	6.848 (8.5)	7.414 (6)	
39.	coordinate and increase legislative lobbying efforts on behalf of libraries	7.742 (2)	7.345 (7)	6.820 (6)

The preceding responses illustrate both the diversity and common needs of the library community surveyed. Furthermore the results, particularly the responses to questions 13g, 15, 18, 32, and 35, clearly express a need by the library community to promote cooperative efforts between and among the various types of libraries.

Several reports and studies conducted in Massachusetts have also noted a dramatic shift in perception on the part of librarians from "collection-oriented, self-sufficiency" toward the need for expansion beyond the scope of the local collection and acquiring access to a wider range of materials through cooperative efforts, benefiting both user and librarian. As a document supporting the FY1982 budget recommendations of the Senate Committee on Ways and Means (Senate 2222, June 1981, Vol. II), entitled Policy Report 13: Libraries of the Massachusetts System of Higher Education, emphasized, the cost-effective nature of cooperative activities is envisioned as contributing to the development and utilization of a database of holdings of Massachusetts libraries in public higher education for access and resource sharing.

In early 1983, while developing the automation plan, a subcommittee of the Automation Planning Committee conducted a survey of several special libraries in "high tech" and other fields to assess their information needs. When asked if the librarians used other libraries to meet their users' needs, 90% responded in the affirmative. Over 50% of the special librarians utilize an online bibliographic search-retrieval system. Obviously, the special libraries have a need for informational resources beyond their local collections to meet the needs of their users.

In late 1981 and early 1982 the Board of Library Commissioners and the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) assessed need priorities of public, academic, and special libraries and library consortia using a modified Delphi technique employing a two-stage questionnaire. The first questionnaire posed a general question to which participants could respond in whatever manner they chose. The 400+ responses were then grouped into categories, eliminating duplicates and those responses not amenable to numeric ranking. The remaining responses were then contextually reviewed, combined where possible, and finally reduced to a manageable 28. Participants then had the opportunity to rank the responses numerically from one to ten indicating their priorities. Rankings were statistically analyzed employing an arithmetic mean which yielded eight high priority areas (in priority order:

1 Union list of serials on a statewide/ regional/local basis
2 On-line catalogs for resource sharing (interlibrary loan capability)
3 Support of capital costs for library participation in networks
4 Development of a statewide plan for library automation
5 Automated circulation systems on a statewide/regional/local basis
6 Development of networks and interfaces among networks
7 Access to bibliographic utilities
8 Training/workshops on automation

The rankings indicate that librarians recognize the need to share resources by participating in cooperative activities and networks. Shared circulation systems were viewed as a major tool for resource sharing with interfaces and communications between systems constituting a network.

Some Thoughts

Ready access to information and knowledge is indispensable to individual advancement as well as to state growth. The right information provided when needed, where it is needed, and in the form in which it is needed, improves the ability of an individual, a business, a government agency, or some other kind of organization to make informed decisions and achieve particular goals.[18] Libraries must come to grips with needs, those usually unexpressed information problems that people have, as well as with their demands, information problems that are consciously expressed.[19]

Several writers have speculated upon the library's future if it does not begin to improve its capability to address user needs. One writer predicts:

> Libraries have a 1,000-year-plus tradition of storing books made of parchment and wood pulp. Soaring materials costs, the advent of cheap microfiche and microfilm, expansion of computer data bases, and electronic links between libraries will make the research facility of the year 2000 unrecognizable from the large library of today. Those libraries that persist in spending 65% of their budget to keep aged wood pulp warm (and cool) will be irrelevant to the needs of their readers.[20]

Another writer foresees that if libraries fail to meet the needs of users, other agencies - computer centers and commercial information systems

- will step in to fill the vacuum. "The spectrum of facilities available to the end user will be substantially diminished without the effective participation of libraries, but still will be sufficient to render today's library service increasingly anachronistic and irrelevant."[21] However, another has written that libraries do have a future, but not as the principal handlers of information, a role libraries obviously do not currently have. "Libraries are and will continue to be a critical link in the chain that produces, preserves, and disseminates the knowledge that has created and sustains our information society." even though the library's relative share of the total information market place will decline as more information providers offer desired services.[22]

Massachusetts has an abundance of recorded information, not a shortage. However, these resources. scattered through hundreds of libraries, are often inaccessible to our state's residents who need and want them, and are therefore lying largely untapped. Thus, the challenge is to find the means for making these rich informational resources available to more people through increasing access to our state's libraries.

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4. THE NEED FOR RESOURCE SHARING

As discussed earlier, Massachusetts residents need information. Over decades, libraries have developed collections and services in an effort to meet those needs. For the most part, these efforts have been largely based upon the concept of individual library self-sufficiency in meeting user demands that materials be available on-site and immediately.

Several factors limit self-sufficiency. First, financial limitations impede building comprehensive local collections. Second, libraries often lack the physical space for such an effort. Finally, there [illegible] often a lack of expertise in developing and evaluating the collection.[1]

At a time when users are demanding greater efficiency, library operations are becoming increasingly expensive while declining in cost-effectiveness. The cost-effectiveness criterion means that output must increase or improve with relatively constant levels of funding or it must remain constant at reduced levels of funding. Library costs have risen rapidly in recent years resulting in higher costs per unit of output and lower labor productivity. The prices of library inputs, that is, books, journals, and labor, have increased more rapidly than prices generally.[2]

For example, the average hardcover book price in the United States has increased by 20% from $23.96 in 1979 to $29.99 in 1984. The average prices for hardcover books for colleges and universities increased by 24% during that period. Trade paperback prices increased by more than 48%. Indicative of increases in the cost of library materials can be seen in U.S. periodicals. the average subscription for colleges and universities increased by 35% while subscriptions as a whole increased by 49%. To acquire one copy of all hardcover books and all trade paperbacks published in 1984 would have cost $1,141,445. That exceeds the materials budgets of a majority of Massachusetts libraries, and does not even consider the cost of periodicals and other serials, microforms, mass media paperbacks, non-print materials such as videocassettes and records, and duplicate copies of high- demand, popular materials.[3] During the corresponding period, Massachusetts public library materials expenditures increased by only 25%, and it is reported that the total acquisition expenditures of colleges and universities in the state increased by 30%.[4] Libraries cannot keep pace and have necessarily acquired fewer titles. A review of budgets of all types of libraries, if available, would show a similar trend because of the cost of materials.

The figures above include only those materials published in the United States. In many instances, libraries also acquire foreign published and/or non-English language materials. Such collection development also impacts library budgets.

Increases in the costs of labor in public libraries are keeping pace with increases in total operating expenditures. From FY1980 through FY1986, operating expenditures increased by 26% while salary expenditures increased 25%. However, the number of full time equivalents decreased 10% over the period.[5] Therefore, fewer library workers are available to meet the informational demands of the user.

Another obstacle to self-sufficiency is the lack of physical space necessary to shelve all of the informational sources published. In 1984, 51,058 titles in hardbound and paperback were published.[6] Assume for a

moment that each title is a one inch thick single volume. Acquiring all of the titles would consume 4,255 feet of shelf space. If the books were placed on 36 inch shelves (9 inches deep), and if each shelf were three quarters filled (27 inches), 1,891 shelves would be needed. Three hundred and fifteen shelving units of six shelves per unit would be required. Setting up 10 double-faced shelving units would require 16 rows (or stacks). Allowing for 36 inch aisles for accessibility, and 36 inches at each end of the rows to get around shelving units, housing the books would require 2,700 square feet. It would have required less floor space in 1980 because fewer titles were published. Between 1980 and 1984, the number of titles published increased by 17%.[7] If the trend continues, more floor space would be required each year to shelve new titles than was required the preceding year.

Even if a library could afford to purchase all of the materials needed by its users, and had the space to shelve the material, there may be insufficient staff to analyze the collection, order the materials, and catalog and process the items as they arrived. It would require a fairly large technical services and administrative support staff (billing, claims for ordered-but-not-received items, etc.) to handle 50,000 titles annually. What good is a comprehensive collection if it is caught in a six month backlog in technical services? As stated earlier, public library staffs in Massachusetts have decreased, not increased during the 1980s.

Librarians acknowledge the impossibility of maintaining comprehensive collections and of providing totally comprehensive services to their users based upon a single library's resources.[8] The rate of increase in both the boundaries of knowledge and the complexity of information over the past several decades has put an end to the era in which any library could seriously aspire to complete self-sufficiency.[9]

Librarians have long realized that service to their patrons can be markedly improved through resource sharing arrangements among libraries in order to provide the user with access to resources beyond the local collection.[10] Therefore, the emphasis of meeting the users' information needs is shifting from local possession (ownership) of resources to access.[11] The concept of expanding access through sharing resources has become central to planning in nearly every type of library.[12]

Users have indicated their need for resources from other libraries in surveys. Twenty-nine percent of the respondents in the survey conducted by the Automated Bristol Library Exchange (ABLE) indicated that they use other libraries because the collections are larger and/or more suitable than are the collections of their local public libraries. Over half the respondents stated that they would find a collection of 200,000 volumes a good reason for using their library more often.[13] None of the ABLE libraries hold more than 150,000 volumes. Nearly five percent of the users of Cape Cod libraries ask the librarian to borrow books from other libraries. When asked "what general area of service do you use most in this library?", 11.3% indicated interlibrary loan. Of all surveyed, 91.8% of the Cape Cod residents stated that a library should provide interlibrary loan.[14]

The sharing of collections among libraries of the same type cannot meet the needs of the total community because users need information from more than a single-type collection. Therefore, resource sharing among various libraries will broaden the scope of resources from which the users' needs can be met.

Access to information requires attention to all of its elements: legal access; physical access; affordable access; and, organized access. Legal access means that one has the right to the information, whether established by law or through an agreement with the owner. Physical access is the ability to get to the information in whatever format is useful. Affordable access means that the cost of obtaining the information does not exceed the value of the information. Information must be organized in such a manner that finding the information does not make the costs prohibitive or consume too much of the user's time. All elements must exist for total access and the absence of any one element may serve as a barrier to access.[15]

Individual libraries may have different specific objectives in their resource sharing efforts, but four seem to be basic: 1) determining what resources are available, usually through collection analysis; 2) determining what resources can be shared, usually involving policies and procedures; 3) providing bibliographic access to the collections, usually through locator tools such as union lists; and 4) implementing effective document delivery systems.[16] Whatever an individual library's objectives, resource sharing activities are increasing because of four trends:

- the goals of library services are shifting from collection-oriented to user-oriented;
- fiscal concerns are limiting the self-sufficiency of libraries;
- studies have advanced our understanding of use of materials; and
- technology is more accessible and responsive to library needs.[17]

Although resource sharing can result in access to more materials, it highlights personnel, materials, and other costs previously ignored or minimized, creating management problems that must, and can, be solved.[18] For example, interlibrary loan has never been free. It only appeared that way because money was not changing hands in the transaction between borrower and lender. However, interlibrary loan fees are now being assessed to either the borrower or the library, requiring users and library managers to consider the related direct and indirect costs of interlibrary loaning of material.

Many libraries, particularly active net lenders, are overwhelmed by the increasing volume of interlibrary loan and the resulting increase in costs and workload. Although fees are generally suggested as the solution to the problem, more equalized access to the resources of more libraries would enable more libraries to become involved in the interlibrary loan process. Studies have reported that when the burden for interlibrary loan is spread among more participating libraries, "load-leveling" occurs, shifting some of the lending burden from the larger libraries to the smaller, previously net borrower libraries.[19]

The materials availability which resource sharing seeks to maximize requires trade-offs in time and in customary ways of utilizing library materials. With interlibrary loan, there is a delay in obtaining a particular item because it is not held locally; however, the money saved from that non-acquisition represents an investment in accessibility to more materials than the local library can afford. The cost-effectiveness of resource sharing is diminished, however, because the effort toward the sharing of resources has to run concurrently with the trend of some libraries attempting self-sufficiency.[20]

Some critics of resource sharing claim that it is not a viable

solution to meeting the needs of users. Resource sharing is viewed as a return to "closed stacks" with less certainty of delivery and a longer waiting period since the materials are not available on-site. The alternative offered is to develop larger and stronger local collections to meet the expressed needs.[21] This solution may be fine for libraries with large book budgets, libraries with large areas for shelving, and libraries with adequate staff. But the solution does not consider the financial, space and staffing constraints of most libraries, especially Massachusetts public libraries still recovering from the implementation of Proposition 2 1/2. Rather than deny the value of resource sharing, we must find ways to make access to other collections as easy, direct and efficient as possible.[22]

An issue to many resource sharing participants is that of reciprocal borrowing. This occurs when a person directly borrows material from a public library other than their local municipally-supported public library, on a personal basis rather than an institutional (interlibrary loan) basis. It must be noted that reciprocal borrowing is not solely a public library issue, but may involve any type of library, depending upon the circumstances of the transaction. Many opponents of reciprocal borrowing state that the practice creates a strain on the lending library in terms of library work load and that the borrowing dilutes the ability of the lending library to serve its own constituents. Further, the problem of varied levels of development among libraries may be exacerbated by reciprocal borrowing. Municipal authorities may be less enthusiastic about strengthening their local library if its residents heavily use a library in a neighboring community.

A balance must be struck between the ideal of universal access and the obligation of local libraries to serve local patrons. It is recognized that a lending library incurs costs in serving reciprocal borrowing patrons who provide no tax (or institutional) support. It must be further recognized, however, that despite efforts to raise local library service levels, some reciprocal borrowing imbalances will persist because of unalterable geographic and demographic circumstances.[23]

No library can be self-sufficient. Resource sharing facilitates access to information and thereby realizes a library's main function, which is to serve its constituents. The positive benefits of resource sharing must be made known; the user must understand that the library will indeed strive to purchase those materials which are most needed and heavily used and will rely on resource sharing partners for other publications. By shifting the emphasis from building collections to serving library users, a positive climate for resource sharing is created and the base of materials available to users is greatly expanded.[24]

Therefore, one of the objectives related to the overall goal for meeting needs is concerned with resource sharing:

> Increase citizens' access to Massachusetts information resources by sharing resources as broadly and effectively as possible.

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5. IMPROVING RESOURCE SHARING AND ACCESS: LIBRARY COOPERATION AND AUTOMATION

Resource Sharing and Library Cooperation

Librarians recognize that service to patrons can be improved through resource sharing practices which allow a library to augment its holdings by gaining access to the holdings of other libraries. Encouraged by the prospect of providing better services, groups of libraries develop organizational relationships to increase the sharing of resources. These relationships, sometimes referred to as "library cooperatives", "library consortia" or "library networks" serve as mechanisms which facilitate the sharing of resources among libraries for the mutual benefit of their clienteles.[1] Often the cooperation among libraries for resource sharing purposes, particularly when automated technologies are applied, is referred to as "networking".

The goals of networking reflect those of resource sharing - increased access, improved user services, and the ability to cope with the increased availability of informational materials. Generally, the objectives of a resource sharing cooperative can be summarized briefly:

1. shared access to collections (through expanded interlibrary loan and borrowing privileges);
2. coordinated collection development to avoid unnecessary duplication of materials and to broaden the scope of the total shared collection;
3. shared access to bibliographic data; and
4. development of technical expertise of staff members through continuing education.[2]

The decision to cooperate in a resource sharing effort should be based on three criteria. First, potential members must determine whether they have common interests and could achieve higher levels of service and efficiency by working cooperatively. Second, potential members must be willing to commit the necessary financial support on a continuing basis.[3] Third, it is crucial that the expectations of all members be assessed and that levels of reciprocity be agreed upon from the start of participation.[4]

Resource sharing cooperatives should have a positive impact on users in terms of access to more materials. Cooperation should also enable an individual library to provide more service at less cost than if the services were undertaken independently.[5] The effectiveness of resource sharing depends upon the availability of appropriate communications, technology, and delivery systems.[6] To be effective, a library cooperative should:

1. provide library service to at least as many users and fulfill at least as many requests for library materials as were served by each individual library prior to cooperating with other libraries;

2. provide bibliographic access to library resources at least as rapidly as conventional location devices such as local card catalogs;

3. offer access to a larger collection of materials than is

available at any one of the libraries in the cooperative;

4. provide delivery of materials borrowed within a specified amount of time (determined by members) in a majority of network loans.[7]

There are several types of organizations established by libraries for resource sharing activities:

consortium - a formal association of libraries, usually restricted to a geographical area, number of libraries, type of library, or subject interest, which is established to develop and implement resource sharing among the members and thereby improve the library services and resources available to their respective target groups. The association must be legally incorporated, have formal procedures and administration, and control a budget to fulfill the objectives and goals of the members.[8]

cooperative - two or more independent libraries of any type engaging in specific joint activities to perform library services for mutual benefit according to informal or formal agreements or contracts while retaining individual autonomy.

There are essentially two bases for cooperative arrangements: 1) to share resources more generously, more systematically, and more expeditiously than they would otherwise be shared; and 2) to strengthen the resources to be shared. Eight groups of activities are common in cooperatives: union catalogs and lists; cooperative development of resources; sharing resources in terms of use; communications; centralized processing; cooperatively sponsored planning and surveys; cooperative storage; and cooperative computer centers.[9]

network - two or more libraries and/or organizations engaged in a common pattern of information exchange, usually facilitated by computer and telecommunications technology, for some expressed functional purpose, most often to improve the sharing of local resources.

A network is usually a formal arrangement requiring that specific tasks be performed and specific guidelines adhered to whereby library materials, information and services provided by a variety of libraries and/or organizations are made available to potential users.

A network is usually a distinct, independent organization with a high level of involvement by members, separate from the administrative, political and financial bounds of its member agencies. A central office and staff accomplish network programs rather than merely coordinating them. Financial support is primarily derived from participating member payments for services. Services are often provided through the use of a cooperative data base in machine-readable form, available for access through telecommunications.

The "network organization" is the administrative/human aspect, and the "network system" denotes the hardware, software and technical operations. A "network resource" is used by the network in conducting its operation. A network entity need not create and operate all of is resources, such as the telecommunications facility which may be provided to the network from a vendor like AT&T.

Typical undertakings of a network include reciprocal borrowing, cooperative cataloging, interlibrary loan, local delivery services, cooperative collection development, consulting, and telephone reference service.[10]

Most public libraries in Massachusetts also belong to another library cooperative - the Regional Public Library System. Established by Massachusetts General Laws Chapter 78 Section 19C, a regional public library system, under an approved plan of service, supplements the services of a municipality's public library by providing the temporary loan of library material through deposits collections and/or interlibrary loan (retrieval and delivery of materials), and provides research and reference services as requested by regional participants. Chapter 78 Section 19F allows the regional public library system or any public library or libraries designated by the Board of Library Commissioners to enter into an arrangement(s) to provide services within the approved plan to non-public libraries. The regional systems provide a wide variety of services to their membership including, but not limited to, library development through consulting services.

Some resource sharing cooperatives serve a single type of library, such as hospital libraries or law libraries. Most of these cooperatives are successful because the participants are able to access collections on behalf of users searching for specialized, out-of-print or seldom used materials which are usually held only by similar libraries.

There are advantages to organizing library cooperatives with membership including libraries of various types (public, school, academic, special). Among the many benefits derived are:

1. access to information about bibliographic resources in other types of libraries;

2. increased access to, and awareness of, resources available in other types of collections within the cooperative which enables librarians to gain increased flexibility in the spending of their institution's book and journal funds;

3. access to highly specialized and general collections to broaden locally-held resources;

4. reference searches on databases capable of providing relevant abstracts and/or full document text;

5. the potential for sharing services such as cataloging and ordering of materials; and

6. increased access to human resources, such as subject specialists, general information specialists, and school librarians who have the opportunity to train future users of libraries and information services.[11]

While it is possible for a library to become a member of an existing cooperative, consortium or network, many of these efforts have evolved from informal to formal relationships. For example, several area libraries may get together to develop a union list of serials using a library's microcomputer. The output is photocopied for contributors. This could be considered an informal library cooperative. The list becomes popular, more

area libraries want to participate, and contributors want the list to be printed rather than photocopied. The contributors establish a governance structure (organizational bylaws) in order to assess themselves a membership fee to cover the costs of the printing. Thereby, the informal cooperative becomes more formal with development of simple governance and a membership fee. Later, the contributors desire to convert their union list of serials into a MARC machine-readable format. Because the members cannot afford a self-assessment to cover the costs of this project, the cooperative becomes more formalized in order to apply for and receive grant funds by legally incorporating themselves. During the incorporation process, members more clearly define membership criteria. Also, an annual budget and budget process is established. The formal cooperative is more formalized and becomes a consortium. Eventually, several members of the consortium decide to jointly acquire a circulation/ILL control system and establish a cluster. Because several other consortium members do not wish to participate in the cluster, those consortium members who do establish another formal cooperative similar to a network while still remaining members of the consortium whose primary service is the maintenance of the union list of serials. Such an evolutionary process is not unreasonable, and has occurred at least twice in Massachusetts. What is important to note is that as resource sharing efforts become more formalized, they usually require that additional resources be committed by the participating library.

The most-cited benefit of participation in resource sharing efforts is access to a wider range of materials. Libraries report that cooperation allows them to provide better and faster services which ultimately benefits the end user.[12] Because of its success in meeting needs, the field of library cooperation has been through a period of expansion. The number of organized cooperatives reported in a biannual survey has grown from 515 to 806, a 57% increase nationally since 1976. While the number of single type cooperatives has grown 23%, the most dramatic growth has been in multitypes - a 184% increase.[13]

How Automation is Applied in Resource Sharing Efforts

Resource sharing increases access to informational sources. Many librarians have determined that by employing automated technologies, specifically computers and telecommunication systems, they can improve services for patrons through resource sharing, and simultaneously increase efficiency in their internal operations. Library networks have been established as a mechanism to provide services, including resource sharing, through the application of automated technologies to increase network efficiency and effectiveness. The term "automated network" refers to both the organizations and the systems which link libraries together via telecommunications with computer-controlled message switching and database access. The "network organization" is the administrative/human aspect of networking, while "network system" denotes the necessary hardware and software.[14] A "network utility" is an entity using network systems to provide computer services to network organizations.[15]

The primary reason to utilize automation for resource sharing is that computers provide the necessary processing capabilities required for effective and efficient retrieval in terms of response time, storage capacity, and the necessary linkage and switching between components.[16] Problems of information access are alleviated and the speed in receiving information is improved when computer and telecommunications technologies

are employed.

Essentially, resource sharing networks provide collectively three activities related to the goals of increased access and improvement of services:[17]

1. **Cataloging/ILL Services**

Cataloging services provide bibliographic citations, through bibliographic "utilities" or "networks" (vendors such as OCLC) for users to search, modify, add to, or replace in the database. The database providers incorporate standards in record format and content to ensure record consistency and file compatibility. End products from the file include catalog cards, union lists, and computer tapes of machine-readable bibliographic records.

For purposes of this document, a bibliographic utility means: an organization serving as a source of online bibliographic data stored in machine-readable form on a time-sharing system, produced by various individual sources or cooperatively through networks. The utility provides a standard interface by which bibliographic data are accessible to libraries via telecommunications for such purposes as online cataloging and for facilitating interlibrary loan, either directly or through a bibliographic service center. A bibliographic utility generates and distributes a product.[18]

Further, a bibliographic service center is: an organization that serves as a distributor or broker of computer-based bibliographic processing services (i.e., activities that assist libraries in establishing bibliographic control over their collections and in gaining access to mechanisms for their identification and retrieval). The center may also provide other services, such as interlibrary loan facilitation and maintenance of union catalogs. It gains access to external resources through the facilities of a bibliographic utility; it does not necessarily contribute records directly to or maintain portions of the data base. A bibliographic service center provides services based upon the product distributed by the bibliographic utility.[19]

Although bibliographic utilities have broadened the services offered to libraries, shared cataloging remains the cornerstone of their services. Bibliographic records of all types of material format (monographs, audio-visual, serials, etc.) are added to a utility's database through two principal methods. The first is batch loading of machine-readable records, such as those supplied by the Library of Congress. The second method is direct online member input of records. Libraries access the database file of the utility, searching online for the bibliographic record they want. When the record is found in the database, or created by the member, the resulting machine-readable bibliographic record will indicate that the library owns the item.[20]

The major premise on which shared cataloging databases are founded is that all libraries cataloging a particular item will do so in a fairly similar manner, arriving at approximately the

same conclusions in determining choice and form of entry, and description of the item. Therefore, once the bibliographic record has been added to the database, any member of the utility may use the bibliographic information rather than creating a cataloging record themselves.[21] Access to authority control records essential to public access catalogs on automated circulation/ILL control systems may be provided by the utility, or through a bibliographic service center.

In addition to shared cataloging information, these bibliographic utility databases have become extremely important to interlibrary loan operations. At the bibliographic level, the records are reliable sources for verification. The machine-readable library holdings data in the bibliographic records place them among the most valuable tools available to facilitate interlibrary loan. A utility enables users to search the database for materials desired, ascertain which libraries own the item, make an online request for interlibrary loan from the owning libraries, and receive periodic updating of the current status of the loan.[22] Studies have shown that interlibrary loan fill rates are more successful when requests are simultaneously directed to more than a single fill source.[23]

The databases of these utilities are one of the most powerful reference tools available to libraries, an enormous source of information. In addition to seeking bibliographic information, librarians may use the online name authority file as a combined dictionary of pseudonyms and a handbook of brief biographical information. Another useful resource is a name and address directory file of libraries, publishers, and other library-related agencies.[24]

Another service provided by bibliographic utilities is the use of ordering/acquisitions systems. Using the same type of record as the cataloging file, the acquisition record can also be used as the basis of the cataloging record, thus decreasing the need to re-type the record information. In addition, the acquisition record may be used for cooperative collection development purposes by a group of libraries.

Libraries which have used a cataloging utility to convert records into machine-readable form may then have their file of records copied from the database onto computer tape. The tape can then be loaded onto an automated circulation control system, facilitating the process of conversion from a manual to an automated system. Utilities can also be a major provider of retrospective conversion services.

Another product available from bibliographic utilities and service centers which improves services for patrons is the union list. Libraries in resource sharing cooperatives can convert their serials holdings into machine-readable form using the utility. The database can then be searched online to ascertain ownership of user-requested serials among cooperative members, or among other libraries with union lists of serials. Printed lists which can be updated as desired are an additional service available for cooperative members without online access to the utility's database.

All of a utility's services are structured to improve patron services by improving the library's resource sharing efforts, and by increasing the library's ability to effectively cope with necessary internal functions such as technical services and cataloging. As a result of utility membership, librarians surveyed perceived that more books were borrowed from their libraries; users' access to unique resources was increased; cataloging workflow was improved; and users got the materials they sought more rapidly.[25]

2. **Circulation/ILL Services**

Automated technology can to applied to one of the library's most important functions - circulation of materials. In its simplest form, an automated circulation/ILL service uses a computer system to electronically store the machine-readable bibliographic records of the holdings of the library (inventory) and keep track of each individual holding as to whether it is on the shelf or on loan to a particular patron. Therefore, the holdings (ownership) of the library are electronically stored and displayed, and the availability status of each item can be provided such as "on shelf", "on loan", "at the bindery", etc. This information can dramatically improve the interlibrary loan process.

These systems have other internal uses. For example, if an item to be reserved is out on loan, the librarian can request that the system notify the librarian when the item has been returned and display information about the patron requesting the item (name, telephone number, etc.).

One of the most powerful automated resource sharing tools is an online circulation/ILL control system that is purchased and maintained by two or more libraries cooperatively. Interlibrary loan is a major motivator - the libraries have good collections, but are aware of the limitations of their institutions. By building a common database and linking the collections together online, the circulation/ILL system allows them to inform their patrons immediately not only whether they owned a specific item but whether any of the cooperating libraries owns it - and, more importantly, whether it is on loan or on the shelf.[26] In this design, the computer system is centralized and the remote libraries employ telecommunications to access the system.

The resulting cooperative, referred to as a "cluster", is defined as two or more libraries of any type (excluding library cooperatives funded by a single municipality), formally organized, that share a machine-readable bibliographic database of their library materials on a common computer system. The participating libraries are referred to as cluster members, and the hardware, software, telecommunications and technical operation is referred to as the cluster's system. In most instances, the cluster is similar to a "network" in that it employs a computer system to improve resource sharing, is formally organized and independent from its users which provide financial support, and provides services. Generally, the differences between a cluster and a network as defined are not usually discernible. A cluster is just one possible specific

type of "network". Network is a broader term. A network could be composed of a group of clusters.

At a minimum, the cluster's system provides the cluster's libraries with inventory control of library material through an automated circulation control function, provides bibliographic information about materials owned by cluster members through the cluster's shared bibliographic database, and facilitates interlibrary loan and resource sharing by having the capability of providing online availability status information of the materials in the database to all libraries belonging to the cluster.

A cluster's many benefits include:

1. Increased access and speed of retrieval. It is possible to search the holdings of several libraries very quickly, determine the item's physical location, and immediately know its availability status (on the shelf, in circulation, on reserve, etc.). The system provides the means to make that information known at remote locations from the computer site. Location and availability information save personnel time and costs because librarians know where the item is and whether it is available (rather than sending an unverified interlibrary loan request hoping that the item is owned, and if owned, available for loan).

2. Cooperative collection development and management. Duplication of low priority materials can be reduced; collection development by subject can be assigned to members; user demand and patterns of borrowing statistics can be generated for analysis; and individual library responsibilities for maintaining unique resources can be decided.

3. Simplifying the distribution of lending loads; thereby enabling the system to become a more equitable proposition for net lending libraries.[27]

Another benefit of an automated circulation/ILL control system is its ability to be used directly by patrons to conduct their own searches. Until recently, users conducted their searches in the old familiar way - using the card catalog (paper or microform). If a library had access to an automated catalog, it was used by the librarian to assist the patron in their search or to check the availability status of items not found by the patron. In all cases, the librarian intervened between the user and the automated catalog. However, with the improvement and availability of the Public Access Catalog (PAC) function, the user may conduct their own searches of the automated catalog via a computer device (commonly a terminal or microcomputer), using powerful and effective searching techniques only available through automation. The provision of PAC functions requires considerably more computer processing power and telecommunication channels than does simple provision of inventory and circulation functions.

Many circulation/ILL control systems are available on the library

market. A "turnkey" system is one in which a single source provides the computer (hardware), computer programs (software), and maintenance (of software and/or hardware). Theoretically, these systems are delivered completely operational, ready to be plugged in and turned on; hence the term "turnkey".[28]

The major advantage of a turnkey system is the distribution of software development costs among many users. In order for this to occur, it is necessary that the vendor supply virtually the same system to each user. Parameter tables are necessary to customize the functions for the needs of individual libraries. The major disadvantage of buying a turnkey system is the library's total reliance upon an existing vendor to keep the library's system operating.[29]

An "adapted" system is designed for a specific library and offered to other libraries. While a turnkey system is deliberately designed to be used by many libraries, adapted systems are generally designed to fit the needs of a single library. Therefore, the adapted system may require additional programming before it can be used in another library.[30]

No library is unique enough to need to develop its own circulation/ILL control system. It requires considerable resources in money and staff time,[31] and it is not as "easy" as it looks to many programmers reviewing the computer processing needs of the library for the first time. And once the custom-programmed system is in place, how will it be maintained (who will fix the problems), and who is responsible for further software development and enhancements? Installing a turnkey or adapted system is ultimately wiser (and probably cheaper in the short and long run) than developing a new system.

... the circulation/ILL system's technical ability to be ...tly aware of the location, as well as the current ...bility of needed items (especially in a cluster), and the advent of the Public Access Catalog, will significantly increase the viability of resource sharing.[32]

3. Reference/Source Database Services

Commonly referred to as database searching or information retrieval, reference/source database services involve the process of finding data or information in computer files. Created from a variety of commercial and non-commercial sources including legal, medical, consumer, business, and other subject areas, database files are collections of text and/or numeric data in machine-readable form. They are provided by organizations such as the Pergamon Group of Companies (Pergamon Infoline Orbit), Bibliographic Retrieval Services (BRS), Dialog Information Services, Inc. (DIALOG), government agencies, and libraries, and stored electronically for access by remote users employing a variety of computer devices (such as terminals or microcomputers) via telecommunications.

The information sought and/or provided is not limited to cataloging data. An example is an online community information and referral file which contains information on agencies,

organization and other entities providing services, usually social in nature. In addition, a user may not necessarily need to use interlibrary loan to receive the actual information sought because the full text of the information desired may be available online or through a supplier which provides, rather than loans, a copy of the information.

There are essentially two types of databases. **Bibliographic** database files contain reference or secondary information covering a number of years, and provide searchers with citations to journals, serials, research reports, specifications, or other sources of information. Bibliographic databases do not always provide complete information but identify sources of information for the searcher to peruse. Many files contain abstracts with the citations, providing more but still limited information about the source.

Source or **nonbibliographic** databases may include statistic and other numeric data or the full text of the document, such as LEXIS (legal materials) or NEXIS (business materials). Databases have also been made available to the general consumer which provide a variety of information sources including transportation schedules, current news stories, or items for sale (an "electronic mail order catalog").

Librarians are using reference/source database services in a variety of ways. Most common is the use of the service to locate citations to documents containing information desired by the user. More recently, librarians have begun to use the service as an additional source of information to provide answers to reference questions posed by patrons, and for document delivery of full text, and full text replacements.

Advantages of reference/source services include:[33]

a. speed - online searching is much faster than manual searching.
b. comprehensiveness - the online searcher has access to many more information sources than even the largest of libraries can support in printed (or disc) form. In addition, there are increasing numbers of databases available online which are produced only in machine-readable form and which have no printed equivalent.
c. currentness- online information sources are updated monthly, biweekly, weekly, daily or even hourly before their published counterparts are printed and distributed.
d. flexibility - the interactive nature of online searching permits many more access points than manual searching allows. One of the most powerful advantages is the capability of the searcher to query the database by a variety of entries: subject, title, author, sponsoring organization, date of publication, and to use Boolean logic and positional operators. The searcher has immediate feedback on the relevance of a search and may alter the profile or strategy at any point to increase relevance.
e. public relations - the use of computer technology enhances the library's image as a timely and sophisticated provider of information

Many libraries in Massachusetts have the equipment necessary to utilize reference/source database services. However, because of the numerous techniques required to search the hundreds of databases available, the effective use of the service requires a trained searcher with specific skills. Many libraries cannot afford to train a person to be thoroughly knowledgeable with all databases or query languages, and other libraries without the necessary computer equipment lack direct access to these valuable informational sources altogether. But in a survey of library users, over 61% stated that a library should provide "on-line information searching."[34] Therefore, there is a need for libraries to maximize the personnel resources required for reference/source services by sharing training development to reduce overlap of specific database searching knowledge, and to have this service available in geographic proximity to all libraries in the state so that each library and user will have the opportunity to access the bibliographic and non-bibliographic databases containing the information needed.

As the use of reference/source database services increases, the cost of access (hourly database usage charges and telecommunications) will also increase. The use of optical disc technology, specifically compact disc (CD ROM), may make it possible for the periodic publication and distribution to libraries of these databases for local access.[35]

One of the problems with the three automated services is that they utilize three different databases. The bibliographic utility's database is quite separate from the reference/source databases which is also distinct from the circulation/ILL control system's database. In many cases, the library's acquisition and serials databases are in separate files from each other and from the other databases. Additionally, in several instances, the library would need three different computer devices to access the databases, although a few systems support the use of more than one type of computer device (such as a microcomputer) and "black box" linkages may be used so that disparate functions can share equipment.

To address this problem, many library system vendors are developing multipurpose systems sharing a common database. Acquisitions, cataloging, circulation, public access catalog and serials are considered to be subsystems of the total library system. Referred to an as "integrated online library system" or simply as an "integrated system", the design is a single function database composed of bibliographic data as well as other data necessary to carry out library related functions (e.g. vendor files for acquisition purposes, or borrower files for circulation) and with each function fully interactive with all others.[36]

Both multipurpose and single-purpose systems have strengths and weaknesses. A multipurpose system is generally less expensive than a series of separate single-purpose systems performing the same functions. There will probably be additional savings in time and cost, and an overall increase in efficiency, because a single database rather than several is maintained. An integrated multipurpose system becomes a tool around which many traditional but somewhat artificial distinctions between various operations within the library can be broken down a bit.[37]

A library takes some risks with the multipurpose approach. Most of them involve being locked into a single system developed by a single

vendor. This is particularly risky when all appropriate modules are not fully operational on a system that the library buys. Another problem involves the design of a system that tries to do so many things at once. With a multipurpose system, the vendor may not give all the modules the same priority. As a result, some modules may receive less attention in design and development even to the point that they are not as adequate and far less sophisticated than single-purpose systems designed to perform the same operations.[38]

Despite the risks, there is a need for integrated library systems and the database unifying purpose they serve. As progress is being made in their development, libraries are re-considering their willingness to access several different databases. For example, as linkages are implemented between cluster circulation/ILL control systems to facilitate interlibrary loan, libraries have begun to limit the role of their bibliographic utility to that of a supplier of machine-readable records and to access out-of-state holding locations for interlibrary loan.[39] Librarians must realize that an integrated system is not an end in itself, but a tool to serve the patron. The emphasis should be developing systems that will improve service to users.[40]

Advantages of Applying Automated Technologies in Libraries

The application of automated technologies in resource sharing is commonly used in three services - cataloging/ILL, circulation/ILL and reference/source database services. There are many benefits to be derived from using computers and related technologies in the effort to improve services to users.

1. Increased processing efficiency
   An automated system almost always improves processing efficiency over a manual system. Increased efficiency is realized when the same tasks are performed with fewer staff or in less time than was possible under the manual system, or when different or additional tasks are performed to provide supplementary benefits considered worth the extra effort or costs.[41]

2. Increased productivity (economy of scale) and cost-effectiveness
   Implementing automated systems, especially circulation/ILL control systems, will not save operating costs in a library. It will improve a library's productivity, and improve services to users. For reasons endemic to nonprofit organizations, cost reductions in libraries cannot be achieved easily through investment in automated systems.[42]

   Libraries, and most other nonprofit organizations, are substantially different from the commercial sector. One cannot predict the relative economics of nonprofit organizations by analogies drawn from the commercial world. Libraries have adapted remarkably well to economic stringencies. They have done this by employing ever more spartan practices, and operate with inadequate or marginally inadequate staffing. The result is that there is inadequate margin to amortize the costs of implementing new technologies with immediate savings.[43]

   Although a library cannot expect to realize operational cost reductions, one of the benefits of an individual library's

utilization of automation is related to reductions in unit of cost which result from economies of scale. Economies of scale are the reductions in unit cost that result from increasing productivity.[44]

Most libraries are labor intensive organizations. For example, personnel costs in public libraries in Massachusetts exceeds 65% and is closer to 70% of the library's operational budget. This figure has remained fairly stable throughout the past seven fiscal years. However, the number of full-time equivalent employees in public libraries has decreased by 10%. Circulation (sometimes used as a measure of productivity) decreased from FY1981 through FY1984, but it is now increasing.[45] It will be difficult for libraries to cope with increases in circulation having less staff than in FY1980 prior to Proposition 2 1/2.

In order to improve the relationship between library inputs (materials, labor, etc.) and output (productivity), libraries will have to utilize computers.[46] The automated system should be able to reduce the time spent in carrying out exactly the same tasks that were performed under the old manual system. However, the system will likely introduce new time demands to carry out tasks that were previously impossible or neglected. Staff may also spend additional time with an automated system to perform tasks that were not possible or practical with a manual system, and/or reallocate staff time towards improving services for the user.[47]

Furthermore, libraries should not fail to exploit the potential of modern technologies to enhance the productivity of the user. Libraries are relatively unique among service organizations in that a significant portion of the labor necessary to get service from them is supplied by their clients. Modern technologies, as the banks have clearly demonstrated with Automatic Teller Machines, can be particularly effective in tapping this enormous reservoir of free labor. Automation can reduce the cost to the client of using the library (time required to locate a book, check out a book, etc.), while offering improved, more convenient services, such as locating books in other libraries and the user conducting sophisticated searches using the Public Access Catalog.[48]

Many libraries are too small to take advantage of economies of scale and too poor to invest in advanced technologies by themselves. Therefore, libraries should pool their resources by forming and participating in clusters and sharing in the purchase, development, use and maintenance of sophisticated online computer technology.[49]

Some critics of library automation and resource sharing have stated that the costs associated with automated resource sharing do not justify its implementation. Microform catalogs at a fraction of the cost of an online catalog are suggested as an alternative. The critics further ask, why not expend the same funds on books rather than allocating them on an automated system?[50]

First, a library may not have the staff necessary to process the books acquired, nor the necessary shelf space. Secondly,

microform catalogs are useful in providing the locations of other libraries holding a particular item, but cannot provide the availability status. Third, the dollar spent to access other library collections for resource sharing goes further than the dollar spent for ownership of the title. Assume for a moment that the library needs to expend $20,000 to join a cluster. If the library were to purchase $20,000 worth of books, it could expect to add 667 titles ($20,000 divided by the average price of a book of $29.99 in 1984). Now, the same $20,000 expended to join a cluster would provide access to 500,000 titles (almost all of the Massachusetts clusters have more than 500,000 unique titles). Therefore, the average price of a book accessed is $0.04 (500,000 titles divided by $20,000), or 99.9% less than the cost of owning the book (not considering the cost of processing, etc.) As books continue to increase in price, and more titles are added to the cluster's database, the $20,000 expended on access becomes more and more cost-effective.

There needs to be a balance between ownership and resource sharing. Libraries must strive to acquire the necessary resources locally through which to develop collections and provide services which meet the needs of their users at least a majority of the time. Resource sharing is only intended to supplement basic services and collections when the user need falls outside the scope of the library to provide it. Resource sharing is not intended to replace or supplant either local services or resource development.

3. Improved service to the user

The primary motivation for automation is the improvement of services for users.[51] In technical processing operations, automation often leads to acquiring and processing materials - and therefore getting them onto the shelf - faster than was possible under the previous manual system. In public services, the benefits are no less pronounced. With online circulation systems, improvements in inventory control capabilities and expansion of access points leads to better service for the user. Online searches through reference/source databases often allow bibliographies to be compiled for patrons in a fraction of the time it would have taken to conduct an equivalent search manually. Online catalogs can be placed in many locations inside and outside of the library; in addition, they usually provide more up-to-date information and greater flexibility in searching than do card and microform catalogs.[52] Increasing the users' opportunities to access desired resources in other libraries is an improvement in service dramatically facilitated through the application of automated technologies.

The most persistent obstacle in justifying automation for the sake of improved service is the difficulty of assigning a quantitative or dollar value to the benefits derived.[53] The general rule is that the benefits to society of any activity should exceed the costs of that activity. A comparison of benefits and costs is essential for the library determining the allocation of its limited resources so as to obtain maximum benefits for a community. Many problems arise in estimating benefits and costs. Because of such measurement problems, benefit-cost comparisons can only serve as a guide in helping to make decisions.[54]

4. improved administrative and management information
For a great many applications, automated systems can generate a variety of information for managerial and administrative purposes. Information from the system can assist in deciding how to place multiple copies of books in multiple library locations by measuring demands from reserve lists. The need for additional copies of books in heavy demand could be analyzed. Unnecessary duplication could be avoided at the same time. An administrator could analyze circulation statistics seeking current trends on which to base book buying decisions. Another report could assist the librarian in weeding the collection to create needed space for new acquisitions.[55]

5. as a response to breakdown of a manual system
Often the existing manual system in a library is simply no longer able to handle the work load. For example, increases in circulation and decreases in staff require a more efficient way to perform the function. Many libraries have trouble keeping up with reserve requests, and another manual operation frequently stretched to its limits are overdues. Eliminating cataloging backlogs and revising inconsistent bibliographic information can also be facilitated using automation.[56]

Applying automated technologies to library functions has caused some changes in the way a library operates. Patrons wishing to have a search conducted of databases through reference/source services usually must now arrange for an appointment replacing the traditional walk-in approach to the reference interview.[57] Librarians may also find themselves doing some tasks which are clerical: logging searches, completing bills, distributing search results, and collecting money. In addition, automation causes an increase in interlibrary loan, an increase in reciprocal borrowing, an increase in the in-house use of materials, an increased volume of shelving of used materials, and an increase in demand for photocopying. However, there has not been any noticeable change in staff levels in libraries, either in the number of people working in libraries or the proportion of professional to non-professional staff.[58]

The Future: The Electronic Library?

The "electronic library" is an institution committed to two basic principles: the widest possible access to information and the use of electronic technology to increase and manage information resources.[59] Four attributes that characterize an electronic library are:[60]

- management of resources with a computer
- the ability to link the information provider with the information seeker via electronic channels
- the ability for staff to intervene in the electronic transaction when requested by the information seeker
- the ability to store, organize, and transmit information to the information seeker via electronic channels

It seems obvious that the function of libraries to acquire information for storage purposes is likely to change drastically in this electronic future. Storage will move from the shelf to computers.[61] The ideal configuration of "The Library" will be a mega-network made up of many cooperative endeavors of different kinds and sizes, to which all library users will

have free and convenient access.[62]

Automation must be seen as a means to an end - meeting the informational needs and the provision of services to our clients in whatever library situation. Although a library may employ automation to improve services to meet users' informational needs, it must be emphasized again that participation in an automated resource sharing cooperative and having increased access to informational resources in other libraries does not relieve the library of its obligation to develop resources locally. Resource sharing is a bi-directional activity - to work effectively, a library must be capable of lending materials as well as borrowing. A library should not be termed as the "electronic library", but, rather, a "library which uses electronics" to efficiently and effectively meet users needs. It is doubtful that the near future will be paperless (or bookless), with all information found only in electronic form. However, it is also doubtful that any library will be able to successfully meet the needs of their users without using, and belonging to a resource sharing cooperative that uses, automated technologies.

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6. BARRIERS TO COOPERATION

Although networking is a viable means of resource sharing, many barriers persist. A typology of barriers has been developed by Orin Nolting which is applicable to all types of libraries.[1] Having stood the test of time and numerous studies, Nolting's typology provides a useful framework for discussing barriers.

Psychological barriers are reflected in attitudes or fears that are held by some librarians and some library planning/funding authorities. One such attitude is that of complacency, evident when librarians express satisfaction with the service they offer and thus exhibit no need to cooperate.[2] Library decision makers believe it is the responsibility of libraries to provide their users with all requested materials themselves rather than relying on cooperation. One fear is that participation in a network will alert library funders to the rich resources available elsewhere, raise unrealistic expectations for cost savings, and thereby result in reductions of budgetary support for the library.[3] A related fear is that automation will lead to reductions in staffing levels through either attrition or internal reorganization.[4]

The tradition of local autonomy has been cited as one of the greatest attitudinal barriers to cooperation.[5] A library may know it cannot succeed by itself, yet it is afraid of losing its identity by becoming part of a larger resource sharing activity.[6] It is feared that participation will cause a library to give up some of its decision-making and management prerogatives, particularly in operating procedures, collection policies, service priorities, and budget flexibility.[7] Another concern voiced is that the library does not want to ally itself with an existing cooperative because it is skeptical of, and/or lacks confidence in, the participants.

A second set of barriers stems from the lack of information and experience about user needs and the functions of libraries and services; the failure of smaller libraries to realize the value of larger libraries' resources; nd unawareness of successful cooperative efforts. One of the most frequently cited barriers is the unpredictability of demands on the library by its primary users. For example, students and teachers have an "immediacy of needs" for materials that inhibits schools from lending resources. Librarians do not want to deal with users who do not look kindly upon discovering that the materials they want are out on loan to another library.[8]

Tradition and history operate as constraints to resource sharing because of the human tendency to maintain the status quo and because of past experiences with funding, collection overuse, and the limitations of access to academic and special libraries. For example, there is preference by all types of libraries to cooperate first with libraries of the same type, thereby limiting multitype cooperation. Librarians feel that libraries of other types have little to offer, but will be a drain on their resources.[9] Another reason for this is that libraries are reluctant to become dependent on a fragile network organization where compromise is needed to deal with the diversity of participating libraries.[10] For example, traditionally, special libraries have limited access because their collections consist largely of confidential and proprietary information that cannot be shared.[11]

Undoubtedly, one of the greatest constraints is the historically low

funding levels of libraries. Surveys of libraries have concluded that the funds necessary for capital investment and ongoing operations in cooperative efforts is a major barrier.[12] For example, librarians state that they cannot afford the necessary retrospective conversion costs, the staff training necessary to be able to use an automated system, or the annual maintenance costs for half a dozen terminals. For some libraries, the political or financial timing is such that a request for funds to acquire automated technologies or participate in a cluster is not likely to be favorably received. A comment often heard is phrased in a question - "how can the library buy books and participate in resource sharing activities"? In addition, other library priorities are considered to be more crucial and timely than cooperation, such as a building renovation or construction project.

Another major barrier concerning tradition and history is that most librarians and library boards have a natural fear of their own collections being depleted by heavy use from other libraries.[13] They believe hordes will descend upon materials which were originally intended to be used by a limited clientele. In a recent survey in which 295 Massachusetts public libraries reported non-resident borrowing as a percentage of local circulation, the average for all libraries was 11.68%, with 33 libraries reporting 20% or more.[14] Another fear is that their libraries will be overwhelmed with interlibrary loan requests.[15] As a result, some small libraries feel that the larger libraries do not want to lend to the smaller libraries.[16]

Geographic constraints and the physical limitations of the library present another set of barriers. Distance between libraries, and between libraries and users, affects speed and quality of service, and in many instances determines or strongly influences the size and composition of the cooperative's membership.[17] Library hours may limit participation, as does physical space, particularly if the libraries are incapable of accommodating resources, staff, and users. A limited collection also hampers cooperation. For example, school collections are chosen to support the curriculum, and therefore a school library may not be capable of making a large contribution in materials to the resource sharing activity.[18]

Legal and administrative constraints present a further set of barriers to interlibrary cooperation. Administrative limitations include jurisdictional issues based upon laws and regulations, and constraints imposed by parent organizations. Often it is unclear whether a library can participate in a network because of its legal status. Additionally, some regulations restrict the use of federally-funded materials to certain target groups, removing resources from sharing.[19] A library manager may be reluctant to become involved in interlibrary cooperation because of the substantial commitment of staff time to the effort.[20] Other administrative and legal issues concern the classes of resources to be obligated (time, funds, materials, etc.), provision of data privacy, copyright, and reporting requirements for network activities. Libraries in different setting have different policies, procedures, and priorities which often make cooperation difficult.[21]

Another major set of barriers, not adequately discussed by Nolting, includes technical incompatibilities and uncertainties. There are many barriers to achieving optimum systems of communications, including technical advances yet to be achieved and the lack of standardization.[22] For example, competition among library automation vendors and the failure of libraries to require adherence to such standards as X.25 are major

constraints to resource sharing.

Not all libraries belong to the same bibliographic/cataloging utility, which inhibits automated resource sharing, since the links between systems hinge on the format and content of the bibliographic record. The result is that librarians essentially speak different languages.[23] This is further exacerbated with the incompatibilities between the various disparate circulation/ILL control systems in place in Massachusetts. Although libraries can access one another's automated circulation/ILL control systems, such a linkage occurs only with great difficulty between disparate systems because the librarians using the linkage must know the protocols of the other system. Additionally, libraries are reluctant to participate in cooperatives because rapidly accelerating advances in computer and communications technology may make some network systems obsolete in the near future.[24] It has been suggested, however, that administrative, organizational, and economic barriers are more difficult than technical problems.[25]

Most barriers can be overcome. Administrators must begin to think about library cooperation as a group of libraries working together, with the local library remaining the focal service point. They will not be giving away anything by resource sharing; rather, they will be becoming more responsible to users and funders. It is more a change of attitude than anything else.[26] Careful short and long term planning, in conjunction with legislation, appropriate governance structures, the judicious expenditure of funds, and the application of evaluative techniques can also reduce barriers to cooperation.

Many barriers are perceptions without basis. Experience in Massachusetts has not shown any staff layoffs because of the introduction of automation. If anything, the use of automated technologies requires additional people to work at cluster central sites for administrative and operational functions. Further, there is little evidence that automation has cause any substantive internal organizational change.[27]

Autonomy can be protected through legal processes including statutes and contracts. Nowhere has any library been taken over by a network and nowhere will it occur.[28] The cooperative agreements developed between the members of a cluster have, in fact, reinforced the concept of local autonomy, leaving the library the option of terminating its relationship with the cluster if necessary.

During the past several years, the Board of Library Commissioners has funded most of the capital costs of the central sites of all the clusters in Massachusetts reducing the level of capital funding needed by individual libraries to participate. State and federal funds have also been used to convert several union list of serials into machine-readable form. Recent experience has shown that the ability to demonstrate to funding sources how much better their constituencies can be served by the ability to connect with a growing range of resources will help to secure the necessary local capital and ongoing funding to support these resource sharing activities.

The concern expressed by many librarians and trustees that there would be an increase in non-resident use (sometimes referred to as reciprocal borrowing) has occurred - somewhat. Statistics from a 1987 Massachusetts public library survey (covering the last half of calendar 1986) indicated that over 11% of total circulation was to non-residents of the community. Of the 295 libraries reporting, only 33, or around 11%, had non-resident

use exceeding 20%. Of these 33 libraries, 18 belong to a cluster (8 others were located on Cape Cod).[29] Therefore, with more than 110 municipal libraries in the clusters at the end of 1986, 16% had significant non-resident usage.

If the reciprocal borrowing patterns continue, several cluster members will continue to be impacted dramatically. In 1987, the Board of Library Commissioners' efforts to pass legislation to partially reimburse heavy non-resident lenders was successful although no funding was included in the Act. It must be noted that imbalances among libraries over hours open, location, materials support budgets, and even such factors as commercial development around or near the library, availability of parking, and bus and private vehicle travel patterns of users will affect reciprocal borrowing and non-resident use. Any library with off-street parking, located near a shopping mall will attract residents from other communities coming to that community to shop.

Statistics on interlibrary loan usage are harder to find. However, the Minuteman Library Network tracked intra-cluster interlibrary loan during 1986. The twenty public and academic libraries loaned 11,820 items. However, there were 12 net borrowers (those who borrowed more than they lent) and 8 net lenders. The sum of the differences between individual net lending and net borrowing was 2,490 items, or 21% of the total interlibrary loan.[30] Therefore, "load leveling" is occurring where the number of active interlibrary loan participants results in a spreading of the request and lending burden among cluster members.

Load leveling has occurred because of the inequities of the manner in which interlibrary loan was conducted prior to the introduction of automation. ILL requests were usually sent to only one library at a time. Chances of the item being owned were increased if the request was sent to a library of significant size or with immediate access to an even larger library. Therefore, a well supported, large library would receive many ILL requests from libraries hoping that funding + size = item desired. With automation, however, all libraries owning the book are identified dramatically increasing access to the item, and within a cluster, its availability status is also known. Therefore, requests for materials are forwarded to libraries owning the item, and within the clusters, to the library(ies) where the item is immediately available. As a result, there is a decrease in the need to continually request items from the same source when other libraries also own the item. Clusters should monitor their intra-cluster interlibrary loan, and make adjustments in lending patterns when possible to achieve effective load leveling amongst members.

Overuse of collections by external users can be handled with assurances (bylaws, agreements, contracts, adherence to local library policies, etc.) that a participating library always has first call on its own materials and that the entire logic of a cooperative is to share resources rather than to rely totally on one library.[31] Cost recovery/reimbursement fees for lenders of materials can be negotiated through network agreements or contracts. Technical and cooperative agreements, governance structures and policies, and applicable standards can provide a basis for solving most of the legal, administrative and technical barriers which arise when establishing interlibrary cooperatives, particularly in utilizing automated technologies.

There exists a willingness on the part of many libraries to cooperate, as documented through the two Delphi studies conducted on library and

automation needs by the Massachusetts Board of Library Commissioners. Also, the growth in the number of clusters and its membership, the increase of automated union lists of serials, the numerous libraries participating in bibliographic utility activities, and the many libraries using microcomputers to access the clusters' databases illustrates the need and desire for interlibrary cooperation. Planning the design of an automated resource sharing network in this State requires careful consideration of the many existing barriers with the intent to resolve them.

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7. OVERALL GOAL FOR MEETING NEEDS

The Massachusetts Board of Library Commissioners in approving the Massachusetts Long Range Program 1987 - 1991 reaffirmed the overall goal developed in 1977 for libraries in the Commonwealth to meet the needs of users. The spirit and intention of this stated goal provides the necessary framework with which to begin, and continue, the design of a resource sharing network:

> To provide every resident of Massachusetts with equal opportunity of access to that part of the total information resource which will satisfy individual educational, working, cultural, and leisure-time needs and interests, regardless of individual location, social or physical condition, or level of intellectual achievement.

8. PRINCIPLES EMPLOYED IN DESIGNING THE RESOURCE SHARING NETWORK

These principles are considered basic to the resource sharing network in Massachusetts:

1. Each individual has the right to access the information that meets his or her needs.

2. Each library has an obligation to strive to provide services and to develop resources which meet the needs of their users as frequently as possible at least a majority of the time. Resource sharing is intended only to supplement the provision of local library services and the development of local resources. It should not replace either. Further, automated resource sharing is a means to an end - to assist the librarian and/or the user to locate material and/or information which helps to meet their particular need - and is not an end in itself.

3. All network services should be provided at a level of operation as close to the user as possible. A local library should be the user's most efficient and appropriate service center. Therefore, network services should be provided through libraries as often as possible. The network should support local library services, not compete with them.[1]

4. The objectives of the resource sharing network should be realized without negative impact to the missions of participating libraries, although their methods of operation invariably should be adjusted.[2] All libraries have a responsibility to collect the materials needed regularly by their own constituents.[3] Resource sharing is not a substitute for local acquisition, only a supplement.

5. It is essential that the network enable individual libraries to maximize the gains of resource sharing while allowing for local flexibility; network members should understand and recognize existing individual constraints.[4]

6. The resource sharing network should be built upon existing cooperative systems and existing library strengths. New resource sharing systems, built upon strong individual library collections and services, should evolve where existing cooperatives are no longer effective. The network should not compete with existing arrangements, but rather improve, redirect, and extend those already in existence and offer alternative approaches which will prove more valuable and useful.[5]

7. Networking is not free. Besides equipment and material costs, staff time is necessary to provide shared services.[6] Therefore, each participant should be able to balance benefits with investment. This balance need not be measured solely in the traditional interlibrary loan concept of net borrowing versus net lending of materials.[7] Attention also should be given to the increased benefits of improved access to more resources. A cost-benefit analysis is an appropriate methodology to study the benefits of network investment.

8. The financial and fiscal basis of the continued operation of network components should depend upon local rather than federal, state, and private funding sources. Local funding sources include assessed membership fees, cost recovery/reimbursement fees, and allocations from the member institutions. Governmental and private grants and intermittent local fundraising are unreliable as a financial base since they are more apt to change annually.

9. Resource sharing efforts should not be limited to within the State. When and where economically, technically, and politically feasible and desirable, the State's resource sharing network and its related services should overcome geo-political boundaries, broadening access into the total information resources of the region and the nation.

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9. NETWORK MISSION AND STRUCTURE

After exploring the issues of needs assessments, resource sharing, networks, the role of automation in networking, and barriers to networking, a mission statement for developing an automated resource sharing library network in Massachusetts is necessary to serve as a framework for network activities:

MISSION

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. develop access points into informational resources, and develop and link databases to provide greater access opportunities to resources;

2. facilitate document request and document delivery procedures ; and

3. develop an ongoing education program on resource sharing

One of the purposes for applying automation to library operations is to increase the opportunities for residents to access the sources they require to meet their informational needs. Networks have evolved as resource sharing mechanisms which provide the capability for effectively and efficiently increasing access to information resources at the broadest level through databases of machine-readable records.

The library network concept for Massachusetts is based upon the linking, usually through telecommunications, of its various decentralized components. Those components include:

1. the clusters and their members
2. those libraries with the capability and permission to access the cluster's bibliographic databases using a microcomputer
3. members of bibliographic utilities and/or bibliographic service centers
4. the Regional Public Library Systems
5. library cooperatives utilizing automated technologies in their functions to create and/or access databases, such as union lists of serials
6. standalone circulation (or online catalog) systems

The network is designed to increase access to resources based upon a decentralized structure composed of independent cooperative systems of various types telecommunicating with other cooperatives to: locate needed material (documents and/or bibliographic citations); ascertain availability status (if technologically feasible); and to place requests for the desired

items. Material is delivered through conventional methods although telefacsimile and digital transmission or other electronic means should be considered, depending upon technology, costs, effectiveness, and need. For users, the resource sharing network, with its local basis and decentralized access can provide access to the full scope of information resources to meet their needs.

Linkages and cooperation among the network components should necessarily be decentralized. It is inappropriate for the Massachusetts Board of Library Commissioners to impose a hierarchy upon the network since the user's needs should determine how the network participant seeks resources. Therefore, cooperatives will need to develop resource sharing relationships with other cooperatives in order to access additional resources. Such decentralization requires considerable responsibility at the cooperative level. It creates a need for written agreements between cooperative groups. Further, specific criteria may be needed for inter-component cooperation. For example, inter-cluster cooperation will more than likely be based on the MARC record format. Written policies should exist for interlibrary loan, photocopying, reciprocal borrowing, walk-in service, etc. Libraries may be required to search their own cluster's bibliographic database prior to accessing another cluster, and so on.

There are two critical linkages. First, telecommunication linkages between clusters are desirable to increase access to resources and facilitate interlibrary loan throughout the state. Secondly, it is important that clusters have linkages (interfaces) to bibliographic utilities as a primary source for machine-readable bibliographic records and to access the interlibrary loan capabilities of the utility's holdings file. This linkage is also important so that users of the utility who are not users of circulation/ILL services will have access to the holdings (without availability status) of cluster members through the utility. This intersection of two important holding files (utilities and circulation/ILL services) will dramatically facilitate interlibrary loan throughout the state.

To encourage increased access to all libraries, the Massachusetts library network structure should allow for access by non-automated libraries, and from individual libraries using standalone automated circulation control systems and/or online catalogs who wish to participate in network activities at their own expense. All libraries have a need at one time or another for access to the resources available through the network. Libraries not participating directly in any of the network components should be able to access the network no more than two "levels" removed. For example, public libraries should be able to access the network directly or through the regional public library system (one level). School libraries should be able to access the network via their local public library (first level). If the public library is not a member of the network, it should be able to send the request on to a library which is a participant (second level). Special, academic and private libraries may be able to access resources through OCLC or another bibliographic utility, or through the public library located in their community.

10. ACTIVITIES RELATED TO THE MISSION STATEMENT

This Chapter discusses automated resource sharing activities. Because of the complexity of the activities, this Chapter is not inclusive. Therefore, the reader is cautioned that many of the issues included in this Chapter are also discussed elsewhere in this document. Further, if an issue is not included in the following discussion, it may be found in other Chapters.

1.0 Develop access points into informational resources, and develop and link databases to provide greater access opportunities to resources.

The basis of automated resource sharing is the ability to create machine-readable records and the capability for others to access the database file. This activity is primarily concerned with the development of access points into the various types of database files and with linking the access points to each other to increase the capacity for resource sharing. Another aspect of this activity is the development of interfaces between cataloging/ILL services and circulation/ILL services to increase efficiency.

Database files are accessed for resource sharing by three services:

- **cataloging/ILL services** - database files of shared machine-readable bibliographic records which are create by libraries during the cataloging process and which indicate library ownership; those files may be searched for interlibrary loan purposes.

- **reference/source database services** - database files which provide the searcher with bibliographic citations and/or abstracts of resources indexed in the database; with full text, such as articles, transportation schedules; or with current news stories. These databases are not necessarily based upon cataloging data. In addition, a user may not necessarily need to use interlibrary loan to receive the actual information sought because the full text of the information desired may be available online or through a supplier which provides, rather than loans, a copy of the information.

- **circulation/ILL services** - database files of machine-readable bibliographic records which not only indicate ownership but also current availability (on the shelf and available for loan, in circulation, on the shelf for reference use, etc.) to the requester.

1.1 develop machine-readable databases to improve access through cataloging/ILL services

Increasing the opportunity to access the state's informational resources relies upon locating a wanted item by determining which libraries own the item. Automating holdings information by converting bibliographic records into machine-readable form facilitates access. Cataloging/ILL services, including conversion, are offered by bibliographic utilities and bibliographic service centers. Most libraries have a need to access bibliographic utilities and service centers for conversion purposes. All libraries are encouraged to convert their holdings

into machine-readable form through a utility or by using another process, service or product.

Databases constructed through bibliographic utilities and bibliographic service centers are important for at least two reasons. First, rather than originally cataloging each item, a library using a bibliographic utility may find an existing cataloging record to match against. Therefore, there is decreased need for local original cataloging, saving personnel time and reducing the processing cost per item.

Secondly, the bibliographic utility's database can be searched by participating libraries for interlibrary loan purposes. During the conversion process, the library's local holdings information is attached to the bibliographic record. Other libraries can search bibliographic records to determine which libraries own a desired item. Once an owning library has been identified, an interlibrary loan request may be forwarded.

1.1.1 the following minimum activities should be offered by a bibliographic utility or service center to be considered as providing cataloging/ILL services:

a. online in realtime access to machine-readable bibliographic records from various sources including the Library of Congress and from original cataloging from participating libraries
b. supports AACR II
c. supports full MARC format
d. provides access to the bibliographic records of all participating libraries including local holdings information
e. supports standard, ASCII terminals and microcomputer-based dial access with common terminal emulations
f. supports query by search key (author, title, and others)
g. supports online entry of interlibrary loan requests through an interlibrary function module
h. provides union list capability by definable parameters
i. can be interfaced with local circulation control/online systems.

1.1.2 It is important that all clusters have access to a bibliographic utility as a source for machine-readable bibliographic records for cataloging. Therefore, all clusters which have received in excess of 50% of the costs associated with the acquisition and/or upgrade of the central site computer system should utilize a bibliographic utility or bibliographic service center as the primary or secondary source of machine-readable records. It is recommended that clusters consider establishing centralized cataloging centers to facilitate conversion of participating libraries' acquisitions through bibliographic utilities.

Accessing a bibliographic utility can also provide

cluster members with a source of interlibrary loan. Further, a centralized cataloging center could also serve to access the interlibrary loan subsystem of a utility on behalf of its membership. However, cluster members may utilize whichever means of interlibrary loan is most appropriate for their situation. For example, inter-cluster linkages may be most appropriate. Public libraries may want to forward their request to a contracting library of their regional public library system after searching their own cluster database. A cluster library with an institutional membership in a bibliographic utility may choose to access the interlibrary loan subsystem following a cluster search. Libraries are encouraged to search databases in Massachusetts and/or request resources from other libraries in the state before seeking materials elsewhere.

1.1.3 Retrospective conversion of collections of a general nature is the responsibility of the local library. Retrospective conversion of special collections considered unique in content will be considered for State funding (as available) for cluster participants. Library cooperatives which include public libraries as full members will be considered for State funding, as available and appropriate, if the converted machine readable records would be made accessible through a bibliographic utility and/or a cluster system.

1.1.4 Conversion of current acquisitions is a local responsibility.

1.1.5 The Board of Library Commissioners will consider cluster requests for portions of the capital funds, as available and appropriate, directly related to making a bibliographic utility and/or cluster's circulation/ILL control system's database more accessible for libraries to utilize for conversion and interlibrary loan purposes.

1.2 develop serial databases through NELINET and the New England Union List of Serials (NEULS) project

Serials are a rich source of information, and are, in many instances, more timely than monographs. Union lists of serials continue to be one of the most important reference tools in libraries. Automating union lists increases access to holdings information because the owning libraries may be identified online in realtime, and the products developed from the machine-readable database are varied and can be easily maintained.

Several library cooperatives in the state have converted their union lists of serials through NELINET's NEULS project. NEULS allows libraries throughout New England participating in cooperative union lists to access other similar union lists. In addition, participants in OCLC/NELINET's Group Access Capabilities (GAC) program may also access NEULS.

1.2.1 increase access to the NEULS union list of serials for all libraries

Because of the importance of serial union lists, it is recommended that NEULS participants make their offline union list products available to other libraries on a cost recovery basis. Offline products include lists in print format and CD ROM.

Secondly, while a NELINET member can access all NEULS union lists online, many union list participants cannot because they are not NELINET members. Further, with the proliferation of serial union lists in Massachusetts, it becomes more desirable to have a single statewide offline union list product available. Therefore, it is recommended that the Board of Library Commissioners encourage the development of an offline combined union list of serials of Massachusetts NEULS participants on CD ROM, to be made available to all libraries on a cost recovery basis. A printed version is considered to be impractical because of the size.

1.2.2 increase access to other machine-readable union lists of serials by including those databases in NEULS.

There are other union list of serials projects in addition to those on NELINET's NEULS. To expand the holdings of the NEULS database to be as comprehensive as possible, other union list of serials projects will be considered for funding by the Board of Library Commissioners if the converted bibliographic records are also included in a NEULS database.

1.3 increase access to reference/source database services, and develop other specific purpose databases as appropriate

Reference/source database services increase access to information stored on remote computer systems. Libraries use terminals or microcomputers and usually access specific databases through a database service provider such as DIALOG or BRS. Information retrieved is either bibliographic in that it is essentially an online index of citations, sometimes with abstracts. Or it is full text, that is, the complete information desired rather than just a bibliographic citation.

Reference/source database services will become more important as more databases become available online, as more libraries have access to terminal or microcomputers capable of accessing database providers, and as the cost to acquire, process and store print versions increases beyond their cost-benefit. Further, several citation and abstract publishers may discontinue their costly print versions in favor of providing only online access. An advantage of reference/source database services is that a library may acquire access to more sources of information than it could possibly afford to acquire for local ownership. Information utility is also improved as libraries and users access and pay only for information wanted rather than paying for information which is not utilized.

Offering reference/source database services may alter the manner in which libraries administer reference services. It is difficult to conduct online searches on demand. Many libraries have policies which require appointments in order to prepare for the search procedures and process.

Another area of more recent change is the distribution of information retrieval databases. Databases have been available online in realtime to the library through a telecommunications link. The library pays to access the database, the time consumed in searching, transactional costs, and telecommunication charges. Several databases are becoming available to users in CD ROM or some other digital disk technology which can be owned locally. While the currentness of the database may suffer, the costs associated with searching an online database may decline.

Libraries are encouraged to explore reference/source database searching. The Board of Library Commissioners will consider requests for capital funding, as available from State sources, for a microcomputer, modem, terminal emulation software and initial training to initiate reference/source database services. Funds will not be available for any continuing or operational costs associated with the searching process.

1.3.1 Increase access to reference/source database services for libraries unable to initiate and maintain the services on a local basis through simultaneous remote searching

Many libraries will not be able to offer direct access to reference/source database services because of the necessary ongoing costs and personnel training. The regional public library systems offer their members access to these information retrieval services. Another option is the Simultaneous Remote Searching (SRS) computerized literature searching technique.[1] It allows the information transmitted from a reference/source database service to the searching terminal to be simultaneously transmitted to a second terminal at a remote location via telephone lines. A searcher at the main terminal performs the search while the second terminal only receives. Human interaction occurs through the searcher directing questions to the patron seated at the remote (second) terminal. The patron in turns responds in order to define or narrow the search. The patron is communicating with the searcher and is also seeing the results of the search on the terminal screen.

The advantage of this technique is that little computer training is needed at the remote (second) terminal where the patron is located, and the librarian need not be familiar with the query language. Remote library personnel only need to be familiar with the terminal and the linking procedure. Therefore, a library can still offer patrons access to reference/source database services without the necessary searching expertise, and

without the patron having to travel to the library where the expertise is located.

Another source of information is specific purpose databases which can be developed by individual libraries or by library cooperatives. An example is the community information and referral file which can most effectively be developed through a cluster's central site computer system so that all cluster participants have access, or on a library's microcomputer. Another example is the development of electronic bulletin board systems through which users with access to microcomputers can access and retrieve information.

1.4 expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed

Resource sharing is best facilitated by utilizing online circulation control systems. Inclusion of the physical location and immediate availability status of the desired item in the accessed database file considerably reduces personnel effort in requesting interlibrary loan. The ability to search the bibliographic database files of shared online circulation/ILL control systems dramatically increases access to the informational resources of our state's libraries.

Circulation control systems are either standalone systems or clusters. Stand-alone systems are owned by a single institution. A cluster is defined as:

> two or more libraries of any type (excluding library cooperatives funded by a single municipality), formally organized, that share a machine-readable bibliographic database of their library materials on a common computer system. The participating libraries are referred to as cluster members, and the hardware, software, telecommunications and technical operation is referred to as the cluster's system.

The definition of a cluster is very similar to that of a "network". In most instances, differences between a cluster and a network are indiscernible. A cluster is an example of a possible type of network. Network is a broader term. A network could be composed of a group of clusters.

Because of the importance of circulation/ILL control system clusters in facilitating resource sharing, existing clusters should be expanded in size and scope to include more libraries as participants when and where it is feasible, considering hardware, software, and other factors. Building on existing clusters broadens the database files by increasing the number of resources accessible for sharing and also increasing the number of access points into the shared database file. Furthermore, expanding existing clusters may save costs by requiring only marginal increases in network systems while distributing the operational cost burden among more participants.

It should be noted that not all libraries will benefit from becoming cluster participants. Experience has illustrated that no concrete formula exists to guide a library in deciding whether or not it should join a cluster. Size of the community is important, but not the sole criteria. Several small public libraries in communities of less than 5,000 residents are cluster participants. The questions to ask in deciding whether or not cluster membership should be considered include:

1. Is the library overwhelmed by tasks such as checking-in and checking-out books, overdues and reserves?
2. can the library afford the capital costs such as the necessary retrospective conversion, terminal and telecommunications equipment?
3. can the library afford the ongoing costs such as equipment maintenance, telecommunications, and central site support?
4. Is there a nearby cluster to join, or will a new cluster (possibly requiring a new library cooperative) need to be established? New clusters can increase the necessary capital costs the library may anticipate having to fund.

Some libraries do not belong to clusters because they have no perceived need for automated services. Other libraries can afford to acquire and support automated systems independently, or have no need for the cluster circulation control function. Some want other automated functions, such as an online catalog. The need for resource sharing may be met by services provided by bibliographic utilities rather than through a cluster. In some instances, a library's internal policies are incompatible with cluster policies.

Several factors seem to be most influential in determining the scope of participation in a cluster:

1. population density of the area served;
2. types of libraries participating;
3. document delivery systems in place or feasible;
4. past and current cooperative efforts of participants;
5. patterns of clientele use and their needs;
6. types of network services offered by the system; and
7. funding available for ongoing operations. Telecommunications is probably the most variable cost: the further in distance the participant is from the computer, the higher the costs for telecommunications will be.

Another consideration for expanding a cluster must be the current number of participants. Although economy of scale usually dictates that the more participants the lower the shared costs per participant, the formula is not necessarily true at all times. It may cost more per cluster member to add a new library because of necessary capital costs and the resulting increase in maintenance costs than is offset by the participation of the additional library. Further, the convenience to the patron should be conside Terminal screens displaying individual holdings information may become too numerous and cumbersome if there are too many member libraries. Smaller, geographically unified

clusters can provide faster reaction and better service than is presently possible with larger clusters.[2] Therefore, clusters should periodically review their situation to consider whether or not smaller units may be more cost and service effective.

When it is not feasible to include more participants in existing clusters, new, shared online circulation/ILL control system clusters should be encouraged and developed.

1.4.1 The Board of Library Commissioners should provide state and federal funding, as available and feasible, for the capital costs associated with establishing or upgrading the central site computer system of a circulation/ILL control system cluster to increase the number of participating libraries as access points, or for the establishment of new clusters when necessary. Funds can only be used for the central site computer system and software, its installation, and the training of personnel. Funds will not be provided for equipment, software, or for a service which serves the needs of an individual institution. Funds will not be provided for central site preparation costs, nor for the operations of the cluster. Federal funds cannot be applied toward telecommunications equipment.

1.4.2 Clusters should not be established without assistance from a consultant experienced in the process. Cooperatives planning to establish a cluster may apply for federal funding administered through the Board of Library Commissioners for a consultant to assist in planning the cluster, the development of system specifications and the issuance of the Request for Proposals, vendor negotiations, and system acceptance testing.

1.4.3 Library cooperatives applying for funding from any source administered by the Board of Library Commissioners to establish or expand a cluster circulation/ILL control system should consider the following requirements as minimum criteria when selecting a vendor's system.

a. should be capable of accepting, maintaining and outputting a U.S. MARC record
b. provides the member libraries with inventory control of library material through an automated circulation control function
c. provides bibliographic and holdings information about materials owned by cluster members
d. facilitates interlibrary loan and resource sharing by having the capability of providing online availability status information of the materials in the database to all libraries belonging to the cluster
e. should be capable of providing multi-tier intra-cluster searching within the database. For example, the system must be able to minimally display the holdings of individual libraries, then

a second level of holdings of other libraries as specified in parameter tables, and then a third level in which the holdings of all cluster libraries are displayed.

f. should have an electronic messageing facility for intra-cluster messages such as interlibrary loan requests

g. should have an online public access catalog capability

h. system should be capable of generating various statistical reports including non-resident circulation for public libraries

i. system should be physically expandable to accommodate additional libraries and functionally expandable to accommodate additional applications software

j. system should be capable of providing communication gateways to reference/source database services and electronic mail systems from most terminals in use on the system

k. should be able to implement the protocols from the Library of Congress' Linked Systems Project

l. should be able to remove and transfer the MARC bibliographic database to another computer system without loss of data and format

m. the system should be capable of accommodating dial-up access to the bibliographic database from libraries and from users in business and home environments

Vendors of cluster circulation/ILL control systems are expected to meet all of the above requirements. However, in the event that a vendor under consideration by the library cooperative does not meet one or more of the requirements, the cooperative must discuss the deficiency(ies) with the staff of the Board of Library Commissioners before selecting a vendor's system.

Only "turnkey" systems implementing an "off the shelf operating system and software" will be acceptable for funding administered through the Board of Library Commissioners. A turnkey system is one in which appropriate hardware and software already exist and which functions, with little or no modification except for the development of parameter tables, as a computer system to meet the requirements discussed above. An off the shelf operating system is one that is readily available and operates on different computer systems. The off the shelf software must be written in a standard language, and should be able to co-exist with other off the shelf software packages within the same operating system.

1.4.4 Although it would improve inter-cluster communications and coordination and dramatically facilitate resource sharing, the Board of Library Commissioners will not standardize on one vendor to provide circulation/ILL services for the Commonwealth's clusters. However, to

ensure that a cluster acquires appropriate functional hardware and applications software, the Board of Library Commissioners reserves the right to disapprove of a cluster's choice of vendor if it has provided funds to the cluster in excess of 50% of the costs associated with the establishment or upgrade of the central site computer system.

1.4.5 The Board of Library Commissioners will not require any library to become a member of a cluster, or a specific cluster, and it will not require a cluster to accept a specific library as a member. Cluster membership should be negotiated between the cluster and the library. However, clusters which have received in excess of 50% of the costs associated with the establishment or upgrade of the cluster's central site computer system with funds administered by the Board of Library Commissioners should accommodate dial-up access from other Massachusetts clusters and non-cluster libraries as appropriate and feasible, negotiated between the cluster and the Board of Library Commissioners.

1.5 Increase access into the cluster's bibliographic databases for libraries in the Commonwealth

As has been stated, not all libraries will benefit by becoming cluster participants. Some libraries will not be able to afford the initial and/or ongoing costs associated with cluster membership. Other libraries do not feel the need to automate circulation functions such as overdues and reserves. The fact that some libraries will not become cluster members is actually beneficial for all clusters - there would be severe technical problems if all libraries became online in realtime cluster participants for circulation/ILL services.

However, all libraries need broad access to information and materials resources beyond their own collections. Such access is increased when a library searches the databases of the bibliographic utilities providing cataloging/ILL services. Access may be further increased by searching cluster databases which can provide availability status in addition to library holdings information (ownership). Therefore, it is important to create an environment in which as many libraries as possible have access to cluster databases for resource sharing purposes.

Two methodologies of increasing access have been identified: 1) dial-up access into the clusters' databases from libraries using microcomputers, and 2) periodic production and distribution of the clusters' databases on CD ROM.

Providing this access is not easy, nor will it be free. The clusters will need to support libraries wanting dial-up access with training and with operational support such as resolving technical problems. In addition, a cluster's central site computer equipment may need expansion in order to accommodate the dial-ups and adequate incoming telecommunication lines will require installation and maintenance. Without adequate equipment

and telecommunications, the dial-up libraries will necessarily be limited in their ability to access the cluster, perhaps each library having to be scheduled as to when it can search the cluster's database. Scheduling access should be avoided since it limits the library's ability to meet users' informational needs in a timely manner. Further, the cluster may need a revision in its governance and/or operating agreements to consider possible changes in procedures and policies when considering the addition of dial-up libraries. Clusters will have to monitor the dial-up libraries' interlibrary loan and non-resident usage of the cluster members' collections to ensure that the dial-ups are not requesting material they should be acquiring themselves.

Clusters should not be expected to provide dial-up access to libraries at no cost. Although the Board of Library Commissioners has allocated millions of state and federal dollars into developing the clusters, members also have a substantial investment of local resources in the cluster. All clusters which have received in excess of 50% of the costs associated for the establishment and/or upgrade of the central site computer system with funding administered through the Board of Library Commissioners should provide access to their bibliographic and holdings information databases for non-cluster libraries. A blend of technical and financial incentives for the clusters for this additional effort of providing access is appropriate. The incentives could come from the Board of Library Commissioners, the regional public library systems, and/or the dial-up library. Further, the dial-up library may be required to meet basic criteria, which are discussed later in this general section, before being allowed to access a cluster's database.

Producing and distributing CD ROMs may not create as many problems for the clusters as will support of dial-up access libraries, but the costs may be far greater. However, most clusters will probably implement CD ROM catalogs of their bibliographic and local holdings information databases to supplement online in realtime Public Access Catalogs. Providing copies of the CD ROM discs to other libraries should not create a hardship. However, current availability status of the wanted item cannot be ascertained from a CD ROM copy of the cluster's database.

1.5.1 Clusters which have received funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with establishing and/or upgrading the central site computer system should set aside five percent of all the system's ports, but no more than eight and no less than three, for access by libraries using microcomputers on a dial-up basis. Clusters should be willing to implement dial-up access. The Board of Library Commissioners should consider providing the necessary funding, from State sources as available and appropriate, to enable the clusters to acquire adequate central site computer equipment to accommodate dial-up access.

Clusters should establish incoming toll-free lines into their central site for use by dial-up access libraries

so that telecommunications costs do not become a barrier for libraries to access the bibliographic and local holdings information databases. The Board of Library Commissioners will consider allocating State funds, as available, to partially support the necessary centralized telecommunications costs of dial-up access.

Clusters may assess reasonable fees to libraries wanting dial-up access. The fees should not be transactionally based upon volume. The assessed fees should consider the costs for training, operational and technical support, and for telecommunications.

1.5.2 Libraries wanting to implement dial-up procedures are encouraged to acquire the appropriate computer system to access the circulation/ILL services of the cluster. The recommended minimum system configuration will be determined based upon the technology available at the commencement of the grant round.

The Board of Library Commissioners will consider requests from libraries to acquire this configuration when State funds are available for categorical grant purposes. If a library receives funds administered through the Board of Library Commissioners, the library should meet the following criteria:

1. agree to the annual fee assessed by the cluster
2. accept reasonable guidelines and procedures to access the cluster's database, outlined in an agreement between the cluster and the library
3. obtain written acknowledgment that the cluster can accommodate an additional dial-up member.
4. agree to input their current acquisitions into the cluster's database and/or into a bibliographic utility providing cataloging/ILL services accessible by the cluster.

   This is an important requirement. While dial-up libraries will have access to the holdings of cluster libraries, no other library will have access to the collection of the library using the microcomputer unless the library begins to convert its acquisitions into machine-readable form. Resource sharing is a two way activity that requires giving as well as taking (or loaning as well as borrowing). The dial-up libraries should begin to develop their databases for electronic access by other libraries in order to promote resource sharing.

   It is recommended that the clusters allow dial-up libraries to contribute their holdings to the cluster's database. Although the availability status will always be "on shelf", the ownership information will be well worth the lack of current status information. If

necessary, the cluster may request funding administered by the Board of Library Commissioners to acquire the mass storage devices necessary to store the MARC records of the dial-up libraries. Clusters may also choose not to accept the ongoing current conversion of dial-up libraries, which will mean that a dial-up library will have to utilize a bibliographic utility to meet the requirement of converting current acquisitions into machine-readable form.

5. agree to participate as a dial-up member for no less than three years, unless the library becomes a member of a cluster, or decides to return the computer system to the Board of Library Commissioners.
6. agree to purchase the specific hardware and software recommended by the Board of Library Commissioners, such as the computer model and internal configuration, communications software, and modem.
7. agree to attend the appropriate training program implemented by the cluster, and/or the regional public library system, and the computer system vendor(s).

1.5.3 A technical solution to dial-up access may be the installation of a central telecommunications switch. In this configuration, all dial-up libraries telecommunicate with a central computer processor acting as a telecommunications switching point. Once the telecommunications link is established, a menu appears on the screen and the library chooses which cluster it would like to access. The decision made, the switch establishes the link to the target cluster and communications begins.

The advantage of such a centralized telecommunications switch is that it may reduce the cluster's burden of providing the necessary training and operational support for dial-up libraries. Dial-ups would have to be trained to access the central telecommunications switch - this would be necessary for all dial-up libraries, and could be the shared responsibility of all clusters using the switch. Secondly, if there is a technical problem with the linkage between the switch and the cluster, the cluster need only work with the switch and not a remote library. The linkage between the dial-up library and the switch would not be of any concern to the cluster. For the dial-up library, the advantages include a choice of which cluster to access, and the removal of "guilt" for having to "bother" busy cluster central site personnel with some of the day-to-day technical problems involving dial-up access.

Clusters are encouraged to consider the advantages and disadvantages of this concept. If this or a similar

configuration has potential for use, two or more clusters may request that the Board of Library Commissioners consider funding, as available, to explore its functionality and applicability through a pilot project.

1.5.4 An alternative to dial-up access is to make copies of the cluster's database available for libraries to search locally. This would have been virtually impossible only a few years ago. However, with digital optical disc technology such as CD ROM, this alternative is becoming more viable all the time.

Clusters could arrange to periodically have their databases mastered and then distributed on CD ROM. A cluster may want to produce a copy of its database on CD ROM to supplement its online public access catalogs. Copies of the CD ROM database could be distributed to other clusters, and sold on a cost recovery basis to non-cluster libraries. By accessing the CD ROM disc on a local CD player connected to a microcomputer, the library could search the database for holdings information (ownership) of cluster libraries.

The main advantage of this alternative is that the non-cluster libraries and the clusters would not have to be concerned with all of the requirements of providing and supporting dial-up access. A library could utilize the CD ROM database anytime, and need not be concerned about scheduled access and telecommunications linkages.

There are several disadvantages. First, the cluster may not have a need to produce its database on CD ROM. Without that need, there is probably very little chance that the cluster would produce a CD ROM database solely for distribution to other clusters and non-cluster libraries. Secondly, producing a CD ROM version of the database is not an easy, inexpensive task. The files must be downloaded, usually on tape, which takes time. More time is necessary to produce the master and then to produce the copies of the master. Further, the mastering process requires considerable funding. Because of the mastering costs, and the limited number of copies the cluster could plan on selling, it may not be economically feasible for the cluster to embark on such a process. Write-once optical disk technology may ease the timeliness and economics of mastering a CD ROM.

Another disadvantage is that the CD ROM database cannot be as current as the online in realtime database. Because of the time required to master and distribute the CD ROM database, the CD ROM product may be several months out of date when it is finally distributed to libraries. Further, the CD ROM database, because of its very nature (batch-produced) cannot provide availability status for wanted items found in the

search process. Therefore, CD ROM databases are not as current as online in realtime access to databases, and they cannot display availability status.

Despite the disadvantages, CD ROM databases have a place in resource sharing. They are not as timely as online in realtime access. However, if the database is mastered three times a year, the database is never more than four months out of date. If the cluster is using a bibliographic utility to catalog its current acquisitions, and if the non-cluster library has access to the utility, it is only necessary to access the utility's database to ascertain current acquisitions. Further, a cluster may not add many new titles during the four month period (duplication rate may be higher than new title rate) so that the loss of timeliness may not be too much of a problem. The loss of availability status is much more important, and cannot be easily replaced. Electronic messageing between the owning cluster library(ies) and the non-cluster library requesting availability status may facilitate the interlibrary loan process.

1.6 Increase access into the clusters' databases for library users

As libraries develop machine-readable database files of their holdings, and in some cases close the card catalog or its equivalent, it becomes increasingly important that the library provide its users with a means to access bibliographic and holdings information. In many instances, the librarian must intervene on behalf of users to search the cluster's database file because the users are without direct means to conduct the search themselves. Access into the cluster's machine-readable materials databases, without having to depend on a librarian at all times, should be provided for the library user.

The online public access catalog (OPAC) is a mechanism for providing real-time interactive access to the machine-readable bibliographic records of a library's holdings.[3] The principle benefit for library patrons is increased access to the library's collection through the library's electronic catalog - the database. Increased access is provided in two ways. First, the online catalog provides increased intellectual access by the provision of additional access points or indexes to the library's catalog beyond the traditional author, title and subject indexes found in the card catalog. Additional access points may include series, added entries, keywords or term searching of titles, subject headings and document abstracts.[4] Searching bibliographic records can be accomplished in a variety of ways which need not be stipulated during database creation, and which may be constructed by the user to meet a particular information need at the time the search is conducted.[5] Secondly, the online catalog may also improve users' knowledge and understanding of the bibliographic information stored and presented in a library's catalog. This increased understanding will do much to help the library patron utilize the library's collection more effectively.[6]

There are several advantages to OPACs:[7]

1. the database can be quickly searched on virtually any item of information of interest to the user. The computer itself offers powerful searching techniques, such as the use of boolean operatives, for combining and restricting searches.
2. global changes in headings, for example, can be made easily
3. filing is no longer a consideration, since items in the catalog do not have to be located according to various filing rules. The labor intensive process of bibliographic record maintenance, including the task of correcting card catalog inconsistencies and inaccuracies, is reduced or eliminated with the online catalog.
4. the online catalog can be physically distributed via a terminal to a number of locations both within the library itself and to points outside of the library, and can be used at times when the library is closed. Increased access expands the availability of the library's collection.
5. the online catalog is usually cheaper to maintain than the card catalog
6. the online catalog will provide increased physical access and has the potential of providing a greater number of access points or indexes to the library's catalog. This increased access should mean increased use of the library's catalog and it will probably lead to a rise in the library's circulation.
7. greater access will also lead to increased in-library use of the library's collection. The online catalog's searching capabilities will probably reveal titles and works that are of value to the user but have otherwise remained hidden on the shelves and among the cards in the catalog.
8. several studies indicate that user reaction is very favorable when compared to manual catalogs

There is an additional advantage when an online catalog is shared by two or more libraries, such as in a cluster configuration. The online union catalog makes the holdings of all the participating libraries accessible to the user, reducing the limitations inherent in the collection of any one library and expanding the resources available to the library patron.[8] Resource sharing is greatly facilitated.

Disadvantages of OPACs include:[9]

1. the online catalog search logic is more sensitive to spelling errors
2. the user may become frustrated at getting too few citations
3. the user may get too many citations
4. the online catalog may become unavailable if the power or computer is down
5. there is a tendency for users to trust implicitly in the results from a computer search and it seems likely that

users of online catalogs may in fact obtain less information than they seek
6. users of online catalogs outside of the library miss the new-books shelf and lose the opportunity to pick up a recent magazine or newspaper
7. users will see information as linear rather than relationally because the absence of shelf browsing limits the likelihood of locating related materials on the subject being searched
8. online catalogs tend to integrate an increasing number of functions from circulation to acquisitions. The more the online catalog is expected to perform functions of inventory control, acquisitions, cataloging and public access to the collection, the less likely it is that public users will have a system that is best designed for public use.

Several issues should be considered when libraries implement online public access catalogs:[10]

1. response time - when response time exceeds eight to twelve seconds, the patron's tolerance decreases
2. reliability - the card catalog is considered 100% reliable. Such is not the case with online catalogs. Some vendors only guarantee their system to be up 95% of the time.
3. back-up catalog - what do you do when the online catalog is down?
4. authority control - a public access catalog should include the capability to handle authority control.
5. timeliness of information - delays in updating the online catalog can be a problem if bibliographic data of recent acquisitions is not immediately added to the online catalog database
6. system capacity - the requirements for online catalogs and circulation control are very different. Some suggest that the two functions should be on separate systems. A circulation control system which doubles as an online catalog entails a quantum leap in size, cost, complexity, and sophistication.
7. system compatibility - providing links between online catalogs and circulation systems has been impeded by a lack of standards and protocols and a reluctance on the part of circulation system vendors to accept the fact that they must operate in a service environment containing numerous computers for different purposes. Vendors have discouraged most types of interconnections.

In surveys of the use of online public access catalogs, 90% of all users indicated that their general attitude toward the online catalog was very favorable or somewhat favorable.[11] Seventy-five percent of all users rated the online catalog as better than the card, book, or microform catalog[12], and that they preferred it to all other catalogs.[13] Most users approached the online catalog with subject-related requests, or were looking for books on a specific topic.[14] Users want more online catalog terminals throughout the library and in places where they work and spend

time.[15]

1.6.1 Online public access catalogs should be installed and implemented in clusters when economically and technically feasible to increase access to users of the bibliographic and other database files available, and improve resource sharing efforts. The Board of Library Commissioners may consider requests from clusters for State and federal funding, as available and appropriate, to acquire central site hardware and software to implement online public access catalogs. Requests for funding for local costs such as terminals, and costs for any site preparation, operations and telecommunications are not appropriate.

The public likes online catalogs. Despite all of the work to develop formulas for the optimum number of terminals for public access, the two most accurate appear to be "as many as you can afford" and "more".[16] A problem is whether the library can survive such success in its operations.[17]

Such success may cause serious technical problems. One of the concerns of implementing an OPAC program is system capacity. Public access terminals require considerable computer processing power for operations. In some cases, OPAC terminals need three times the processing overhead as does a single circulation terminal. These additional processing needs usually require additional computer processors. Further, in the same and other instances, the vendor's system requires that a separate bibliographic and holdings database with different indexes from those needed for online circulation control is necessary to work with the OPAC terminals. Therefore, additional mass storage devices, and possibly additional computer processors to manage the drives may be required to provide online public access. Processors and disk drives cost money.

The computer equipment discussed above is needed to manage online public access catalogs. Rather than having all online terminals, a solution to the public access catalog's processing needs may be a combination of CD ROM databases, online public access catalogs, and standard inquiry terminals (not capable of OPAC functions). Several combinations and configurations are possible. For example, the holdings of all the cluster libraries may be updated three times a year on CD ROM. Patrons search for the information sources they need on the CD ROM database. Because the CD ROM database does not include availability status, the user can then use an online inquiry terminal (which does not require the same processing needs as an OPAC terminal) or ask a librarian to ascertain availability status of items found during the search. The main drawback of this configuration is the timeliness of the CD ROM database, which would be several months out of date. The user or the local librarians would need to conduct a second search of the cluster's online in realtime database to find more current material.

In another configuration, the CD ROM database includes only the individual library's holdings for the patron to search. If the item is not owned by the library, the patron then uses an online

public access catalog to identify a cluster library which owns the material, and immediately receives availability status information. This configuration would require more central site processing power than the first example. Availability status, which may not be directly available from the CD ROM database, could be easily ascertained from a local circulation terminal. Further, the local librarians would be more familiar with their recent acquisitions which would not be on the CD ROM database than they would for the all the libraries on the cluster-wide CD ROM database.

Several CD ROM database vendors are exploring and will soon be implementing CD ROM workstation environments where the CD ROM computer system may be linked and interfaced with the library's automated circulation system to provide availability status of a desired item(s) upon demand. Once the user has completed a search using the CD ROM database, the CD ROM's computer system may be used as a remote online terminal into the library's automated circulation files. Thereby, a user will be able to ascertain the availability status of those items desired using the same terminal and keyboard.

One of the advantages of using a CD ROM database as a public access catalog is that the CD ROM computer system may be placed in many locations throughout the library. For example, a CD ROM system could be placed in an area when an online public access terminal could not be located because of telecommunications considerations, such as the stacks. Further, it would be possible to place CD ROM database systems outside of the library building(s) thereby increasing user access to the library's holdings.

1.6.2 Because of anticipated technical and economical considerations of providing online public access catalog terminals, it is recommended (not required) that clusters consider a public access catalog program combining online public access catalog terminals, inquiry terminals and CD ROM databases.

Again, these alternative solutions are considerations if the cluster's computer system cannot meet the requirements for implementing all of the online public access catalogs wanted and needed. Online in realtime is preferable to most batch operations. However, the technical and economical realities may prevent a cluster from installing all of the OPAC terminals it wants.

In addition, CD ROM databases could be produced to serve as backups to the online public access catalogs should a failure of the OPAC equipment, software and/or telecommunications occur.

Another way in which to increase access to the clusters' databases is to provide library users at home and/or at work the opportunity to use dial-up procedures to search the bibliographic files. Such access would be very similar to that offered to other libraries. Users with microcomputers and the adequate telecommunications equipment and software could link with a computer port reserved for dial-up access to conduct inquiries.

There are (of course) considerations in providing dial-up access to users. First, the computer system should have the capability and the capacity to accommodate the dial-up users. Secondly, public service issues may arise. Users accessing the system may not have the direct involvement with librarians familiar with the library and its collections. Provision to help dial-up users may be made through mailed brochures and announcements of system changes, and by planning for extensive telephone assistance. Librarians will probably be inundated with questions about initial hardware and software compatibilities, and will probably be asked for assistance when there is a communications failure. Security issues may also arise, and the library will have to take care not to provide a "computer hacker" with the means to access patron files or modify bibliographic records and other files.[18] Despite these potential problems, offering dial-up access to users will undoubtedly attract new users, and the library's public image will be enhanced.

A telecommunications option to providing dial-up access was discussed earlier. A centralized telecommunications switch for users to link with could be installed as an intermediary to the cluster. Linked with the switch, the user could choose which cluster to access from a displayed menu. Once the decision had been made, the switch establishes the telecommunications link between the switch and the cluster. This configuration may reduce the technically related telecommunications problems arising in the cluster from users and libraries having dial-up access.

1.6.3 Because of the potential for dramatically increasing access by library users to cluster bibliographic databases and the enhancement of the libraries' public image, it is recommended (not required) that clusters consider providing library users with the opportunity for dial-up access. If available, unused or underutilized ports which have been reserved on the central site computer systems for dial-up access by libraries may be reallocated for library user dial-up access, if technically feasible, and considering security issues. Dial-up access libraries and users should not have access to the same ports.

1.6.4 Clusters are encouraged to consider the advantages and disadvantages of the utilization of a centralized telecommunications switch to facilitate dial-up access by library users. If this or a similar configuration has potential for use, two or more clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, an exploration of its functionality and applicability through a pilot project.

1.7 facilitate access between standalone databases and cluster databases, and between standalone computer databases.

Reciprocal access between standalones and clusters and between standalone computer systems would enhance the resource sharing

effort by increasing accessibility to library resources.

1.7.1 Equipment and software which facilitates the searching of standalone databases by clusters and/or by other standalones should be installed when economically and technically feasible. The Board of Library Commissioners will consider requests for funding, as available and appropriate, for projects which promote the reciprocal exchange of bibliographic and/or item information between standalones and clusters and between standalones of at least two types of libraries. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality.

1.8 Increase access to other databases of informational resources

As has been illustrated, databases of machine-readable records facilitate the identification of wanted informational resources. Automated circulation/ILL control systems are an effective tool by which to locate machine-readable files of bibliographic and other records.

Because of their capability to serve numerous access points (libraries), clusters should consider loading several types of machine-readable database files onto their systems. For example, a copy of the members' union list of serials could be loaded onto the computer system for access by all members. Another database which could be created on the circulation system is the community information and referral file, a listing by category of local and state organizations providing services to residents of the area.

Those cluster offering public access terminals and/or dial-up access from users' homes and business are encouraged to consider implementing an electronic bulletin board on their computer system. Bulletin boards may be used to support the community information and referral file, or provide a means for cluster libraries to inform patrons on library events, programs, or other happenings. It could also be used as an online "suggestions box" with librarians conducting a dialogue with users concerning library issues.

1.8.1 Clusters are encouraged to consider loading and/or creating other informational files in addition to the monograph bibliographic database for inclusion on their central site circulation/ILL control systems. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, to initially tape load or create a database which would improve and increase access to informational resources for library users.

Unfortunately, many useful informational databases cannot be loaded unto circulation/ILL control systems because of their nature, size, or ownership issues. Such databases are usually accessed via reference/source database services. However, it is important that access to such services is provided.

Because of the importance of the reference/source database services, many libraries will individually provide the service, or obtain access to the services through the regional public library systems. Other libraries may use the gateways to reference/source database services provided by the bibliographic utilities. The computer system installed by the cluster for circulation/ILL services should be capable of also providing a means to telecommunicate out to reference/source database services. A function designed to allow a member library, choosing from a menu, to use outgoing ports on the central site computer system for access to other computer systems should be available on the cluster's system. A terminal used by the reference staff to query the cluster's database could also be used to access and search an information retrieval system providing reference/source database services. All clusters members would then have the means to access reference/source database services and provide the services to patrons locally if they so choose.

1.9 explore increasing access to informational resources through shared, integrated systems

All three services discussed - cataloging/ILL services, reference/source database services and circulation/ILL services - usually function from three separate database files, usually on separate computer systems, requiring a variety of terminals and operating skills. Librarians and system vendors have always envisioned, and some have attempted and succeeded in "integrating" most of the common and more heavily-used functions into a single function database, taking advantage of few terminal types and a common methodology of operation. In such an integrated environment a machine-readable entry is created only once, stored in a single database, and then used as necessary by each of the functions available. Acquisitions, cataloging, circulation, public access catalog and serials are considered to be subsystems of the total library system. Each approach, that of the integrated system (multipurpose system) and the single-function system has strengths and weaknesses discussed earlier in this document.

An alternative to integration is that of providing compatibility between functions. In this concept, a machine-readable entry created by each function is stored in separate files. However, each file can be accessed, read and manipulated by each function. Therefore, while there is no single file, all data can be used by any function on the system. Another aspect of this concept considers that all functions are on separate computers. A user may, at a terminal, interact with all functions without a need for a specific purpose terminal, and all functions can interact with each other and with their respective database files.

Librarians have requested many functions in an integrated system: circulation control; public access catalog; MARC record capability to accept, change, display, and output full MARC records in all standard MARC formats; authority control; acquisitions, materials booking; reserve book room control; serials control; local reference files and community information;

word processing; information and referral files; electronic mail; COM catalog production; remote terminal access; two-way cable television; teletext capabilities; payroll and check production; budget control; staff scheduling; personnel records; personnel work statistics; access to outside databases; access to other automated library systems; interfaces to bibliographic utilities; and inclusion of high-use indexes such as Magazine Index. Not all of the above features are included in a single system at this time.[19]

There is a need for integrated systems, and for the database and equipment unifying purpose they serve. However, some considerations are necessary. First, there is no need to integrate all library functions into a single database file on a single computer system. For example, why integrate budget control on a shared circulation/ILL control system when it is probably cheaper for this function to be placed on a local microcomputer? Statistics generated from the circulation system can provide information for the budget, but it is not necessary to use a larger system to perform a local function. The same may hold true for payroll and check production.

Secondly, in Massachusetts, an important aspect of any integrated system should be resource sharing. The system should be capable of providing access to the holdings of all libraries sharing the system, provide availability status, and facilitate inter-library communications with electronic messageing. In addition, it should include a means to access other appropriate computer systems including other shared circulation/ILL control systems and reference/source database services. Resource sharing as a function should be included with all the other desired functions in any integrated system.

Librarians should realize that an integrated system is not an end in itself, but a tool by which to serve the patron. The emphasis should be in developing integrated systems which ultimately improve services to the library user.[20]

1.9.1 Clusters should consider developing an integrated system which includes the following functions: acquisitions, cataloging, circulation, public access catalogs, serials, and resource sharing. Resource sharing includes intra-cluster electronic messageing, and the provision of gateways to other computer systems. Other informational database files should also be considered for inclusion such as information and referral files. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, for the necessary central site computer hardware and software to implement functions of an integrated system. The circulation and resource sharing functions should be present before other functions will be considered.

1.10 Increase access into informational resources and improve system cost effectiveness and efficiency by exploring and implementing remote distributive processing systems

Cluster configurations depend upon telecommunications from the remote library to the central site computer system, and a computer system capable of processing millions of transactions from numerous libraries annually. There are several advantages to such a centralized configuration:

a. only one bibliographic database is maintained, and libraries need to make only one query to access numerous libraries
b. only one computer room site must be prepared
c. only one set of hardware and software is needed from the vendor
d. member libraries share the ongoing costs of operations

In many instances in the state, the only way in which a library could have access to a circulation control system was through the cost effectiveness and efficiency of the cluster configuration.

There are disadvantages to the cluster configuration over single library systems:

a. computer processing needs are greater because of the number of participating libraries which usually results in requiring a multi-processor environment. The more processors needed, the more processor overhead required which may affect overall system response time.
b. higher telecommunications costs
c. when the computer system fails, all participating libraries are affected

There are two basic alternatives to the centralized cluster approach: the standalone system and the distributive system. In the standalone environment, each library has its own complete computer system - hardware, software and database files. Although it is effective for the single library, it is limited in its resource sharing capabilities since it lacks a shared database. In addition, a standalone system is usually more expensive on a per library basis than membership in a cluster. A more viable alternative to the standalone which still retains its resource sharing capabilities and economy of scale is the distributive system.

In the typical cluster centralized configuration, nearly every transaction must be telecommunicated to the central site computer system online in realtime, from a database query to checking out a book for circulation. This not only requires telecommunications, but also central site computer processing power to handle the functions and transactions. When there is an increase in telecommunications or central site processing requirements, additional equipment and funding for its related ongoing costs are needed.

In a distributed system, many of the typical routine functions are removed from the central site computer system and relocated on a small computer, probably a microcomputer, at the local library. For example, each time a book is charged out, the function is performed on the local library's computer rather than the central site's computer system. Then, after a certain volume

of transactions or at a specific time, the information about the library's transactions are sent in a batch to the central site computer system, updating the appropriate files.

Not all functions would be relocated to the local library's computer. The library would still have access to centrally stored machine-readable bibliographic and other databases for resource sharing purposes in this distributed concept. System reliability would increase because some of the cluster's automated functions would still be available from the remote computers even if the central site computer system or telecommunications lines failed. Further, there would be need for fewer telecommunications lines which could reduce costs. In fact, libraries may even consider replacing some of their leased telecommunications lines with packet switched telecommunications. In a packet-switched telecommunications system, the user pays only for the volume of information sent to the central site computer system over logical circuits rather than paying for physical leased lines whose costs are calculated by the mile rather than by the volume and time necessary to send and receive information. Response time for other functions and transactions may improve since the central site computer system is unburdened from some of its transactional load. A major advantage of this distributive configuration would be the decreased need for additional central site computer processing power to accommodate increased transactional loads of participating libraries or the increased load gained when new libraries join the cluster.

There are a few disadvantages to this distributed configuration. Equipment maintenance costs may increase overall for the cluster because of the inclusion of the remote computers. Each library would be required to prepare an adequate site for the remote distributed computer system. Staff at the local library would have to be trained in resolving computer system problems as they occur instead of relying upon central site personnel every time a systems problem arises. Vendors may require additional software license fees for each remote distributed system installed.

Considering the possibility of decreasing the need for additional, costly computer processors when transactional loads or the number of cluster participants increases, improving system reliability when central site systems or telecommunications lines fail by remotely distributing some functions, and leveling or reducing increases in the number of telecommunications lines to accommodate increases in transactional and functional loads, remote distributive processing is of considerable interest in cluster operations.

1.10.1 Clusters should consider and explore the possibilities of remote distributive processing. Clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, for pilot projects to demonstrate remote distributed processing. Funds can be utilized for necessary central site hardware and software modifications required to implement remote distributive processing and the remote computers for no more than three of the cluster's libraries. Site preparation,

telecommunications and operational costs are local expenses.

As has been stated previously, not all libraries are able, or willing, to become members of clusters. It is particularly frustrating for those libraries wanting to become resource sharing participants through cluster affiliation but cannot because of financial considerations. However, distributive processing may offer a long-needed solution for these libraries.

Several library vendors offer automated circulation control on microcomputers for libraries. While these systems may automate the internal circulation functions of a library, they can do little for resource sharing except to serve as terminal emulators for dial-up access into clusters which most microcomputers and communications software can accomplish anyway. Even though the library is "automated", cluster members have no way of knowing if the library owns a particular title, or if the item is available for loan since it is difficult for the cluster to electronically search the database on the microcomputer. These microcomputer circulation control packages are not compatible and cannot be interfaced with the clusters, which hinders effective resource sharing. However, there may be two solutions which would yield a microcomputer-based circulation control system which could interact with clusters for resource sharing purposes.

The first alternative would utilize the backup systems for the circulation/ILL control systems. Most circulation services vendors have developed backup systems using microcomputers to record transactions when the computer system is down. When the computer is operational again, the transactions are uploaded into the system to update the main files. If these backup systems were enhanced to run all of the circulation and database functions, a library could buy and utilize the backup system of a neighboring cluster. They could convert their database through the cluster, download it, and then operate as if the backup system was their normal operating system. Ongoing conversion would be conducted through the cluster as if it were a dial-up access library. Then, at night, the library could upload its transactions and update the appropriate files at the cluster's central site. Thereby, all of the library's holdings are included in the cluster's database, and the library's circulation transactions would be updated by batch on a daily basis so that other libraries not only know what the library owns, but whether or not it was on the shelf only 24 hours ago. With the circulation of most libraries under 1,000 transactions a day, the lack of online in realtime availability status will not be too crucial to the success of this alternative.

A second alternative would be to install the same remote distributed systems developed for cluster members in non-cluster libraries. Again, the non-cluster library would convert its holdings through the cluster so that the database would be on the cluster's central site computer system. Then, using the remote distributed processing system as would cluster members, the library uploads its transactions to update the appropriate files. The advantage of this alternative is that vendors are more likely to develop, and libraries more likely to purchase, remote

distributed processing than enhanced backup products.

Both of these alternatives depend upon good relationships and contractual agreements between the cluster and non-cluster library. In fact, the library may be considered a cluster member, receiving specific limited services as compared with other cluster members. Whatever their cluster membership classification, all libraries could benefit from the development of either or both alternatives. For the cluster member, it would yield either a better backup system or remote distributed processing. For the non-cluster library, the development would yield a methodology for automating some of their internal library functions. All libraries would benefit from the increased opportunity for accessing informational resources for resource sharing.

1.10.2 The Board of Library Commissioners encourages the consideration of clusters, non-cluster libraries, and vendors in developing microcomputer-based systems which would be compatible and/or interfaced with clusters to facilitate resource sharing. The Board of Library Commissioners will consider requests from libraries and/or clusters for funding, as available and appropriate, for a pilot project to develop such a system as described above, or another appropriate alternative.

One issue raised in library literature is that distributed systems may be a step away from cooperation - microcomputers will free libraries to act independently of the necessary governance required for clusters.[21] Others point to the introduction of the CD ROM disc and state that the era of shared systems is about to end. While the new technology may revise current practices, it will not end the need for resource sharing activities. A library may operate its standalone system in whatever manner it chooses - deciding which standards to implement, policies to conduct, etc. However, it still needs resources beyond its own collection. Therefore, if all libraries were to individually automate, searching the collections of other libraries would be conducted in either one of two ways: through a bibliographic utility, or by individually contacting libraries until the item was found or the dimes ran out. A shared bibliographic database still makes sense for resource sharing. And only the cluster's database files can provide availability status for all the items in its database. Clusters also provide an economy of scale for ongoing operations that the individual library cannot offer when considering the issue of access to collections beyond the one library's. Therefore, while new technology and procedures may challenge the need for clusters, it should be pointed out that the essence of the cluster is its shared bibliographic database whether on disc or in mass storage devices, and the opportunity to ascertain availability status online in realtime for all database items. New technology and procedures will increase access into this resource, not eliminate its need.

1.11 develop telecommunication linkages between/among access points

Resource sharing efforts are essentially based upon

telecommunication linkages between/among access points - those decentralized, individual components of the network including dial-up libraries, clusters, bibliographic utilities, standalone circulation (or online catalog) systems, and others.

One of the most important linkages is between shared circulation/ILL control systems. With this linkage, libraries in one cluster can search the holdings of libraries in another cluster and can also ascertain availability status. Inter-cluster linkages dramatically facilitate resource sharing.

All computer and automated systems have unique characteristics and idiosyncrasies. Most computer systems can communicate and exchange data with other computers of the same make and model. In general, however, computers from different manufacturers cannot exchange data because of differences in hardware, software, and data representation. Therefore, two library systems with different equipment must develop special procedures and software to exchange messages. If there is a need to add a third system, additional sets of procedures and software are required.[22]

To solve this problem, the standards community developed the Open Systems Interconnection (OSI) as a standard telecommunications model governing the communication of information between different systems. Under OSI, a system can communicate with any other OSI system using one communication protocol. Adding a new system to the network has little impact on existing participants.[23]

Although OSI exists, few vendors of circulation/ILL control systems have established procedures to link with circulation/ILL control systems of different vendors. Although this linkage is technical in nature, it is certainly feasible. Vendors, for the most part, have discouraged all types of interconnections rather than foster them.[24] Such an effort, whether openly conducted or not, hinders resource sharing.

The Library of Congress-sponsored "Linked Systems Project" (LSP) is an effort to establish communications between different computer systems for library functions using the ISO and other standards.[25] In the computer scenario of LSP, a user of system X can search the files of system Y from a system X terminal using system X search procedures.[26]

There are other procedures which can be implemented for linkages between/among access points. Clusters and other libraries belonging to the same bibliographic utility can access each other's holdings, although the ability to ascertain availability status is lost. Clusters and those libraries with machine readable records could produce CD ROM copies of their databases and share them with other clusters. Clusters and other libraries could also acquire terminals of the various circulation vendors to access disparate systems (for example, a cluster using system A acquires a terminal from system B to access system B and identical vendor systems). This could be an activity of the centralized cataloging/ILL center established by a cluster. Another option is the use of a microcomputer and software which

can emulate the terminal type of the target circulation system. An electronic mail system could also be utilized. If the requesting library can identify an owning library, the electronic mail system could be used to request the item. If the owning library is unknown, messages must be left to determine ownership prior to requesting the item. In this age of numerous electronic databases, it should be a rarity to not be able to identify a library owning an item.

1.11.1 Clusters are encouraged to make an effort to establish inter-cluster communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. Clusters may request the Board of Library Commissioners to consider for funding, as available and feasible, pilot projects establishing inter-cluster linkages based upon LSP protocols to facilitate resource sharing efforts. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented.

In addition, contracting libraries which directly provide interlibrary loan services to members in the regional public library systems may apply for funding administered by the Board of Library Commissioners, as appropriate and available, for a microcomputer and appropriate software which will be used to access cluster systems other than their primary cluster.

Linkages between cluster systems and standalone circulation (or online catalog) systems, and between individual standalone circulation (or online catalog) systems exhibit problems similar to those of inter-cluster linkages. Reciprocal access between clusters and standalones and between standalones would facilitate resource sharing.

1.11.2 Clusters and standalone circulation (or online catalog) systems are encouraged to establish communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. The Board of Library Commissioners will consider for funding, as available and feasible, pilot projects establishing linkages between clusters and standalones, and between standalones of at least two types of libraries, based upon LSP protocols to facilitate resource sharing efforts. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented.

Another important linkage discussed earlier is between the clusters and bibliographic utilities. Accessing a bibliographic utility from a cluster facilitates resource sharing beyond the cluster because cluster members can identify libraries owning requested items. When a cluster participates in a bibliographic

utility, non-cluster libraries which are also participants in the utility's services have access to those cluster items converted through or tape loaded into the utility. Access to informational resources is increased and resource sharing is facilitated.

An online in realtime interface between a circulation/ILL control system and a bibliographic utility provides cluster members with the ability to copy bibliographic records from a cataloging database and immediately place those records in the circulation/ILL control system's database file. Such a capability ensures that the cluster's database file is as up to date as possible. Further, the interface serves as a time and labor savings device. Without the interface, personnel must either input cataloging records into the cluster's database, or wait for a computer tape of machine-readable records provided by the utility for merger with the cluster database file.

1.11.3 It is important that clusters develop and maintain telecommunications linkages with bibliographic utilities for conversion. An interface may be needed for the online in realtime transfer of machine-readable bibliographic records processed during conversion. Therefore, clusters may request funding, as available and feasible, for the capital costs of developing an online in realtime interface for conversion purposes with bibliographic utilities recognized as such.

Another important access point into the informational resources of our libraries are those libraries using microcomputers to search the cluster's bibliographic databases for resource sharing. The most common telecommunication link between the cluster and the dial-up access library will be standard 3002 telephone lines. Agreement as to telecommunications procedures and costs is the responsibility of the cluster and the dial-up access library. Other responsibilities for cluster and dial-up libraries were discussed earlier.

1.11.4 Whenever possible, toll-free lines should be established at the cluster central site to reduce the telecommunications costs between the remote dial-up access library and the cluster. The Board of Library Commissioners will endeavor to secure State funds to partially offset the costs of the toll-free lines.

Dial-up access libraries should also telecommunicate with a source of machine-readable records for their ongoing conversion effort. If the dial-up access library is converting on the cluster's database, telecommunications paths will already have been established. If the dial-up access library is using a bibliographic utility, telecommunications procedures will usually be dictated by the utility's communications system.

Another access point requiring telecommunications will be the remote library user at home or at a business searching the cluster's database for informational resources. Again, telecommunications will be based on standard 3002 telephone lines. The cluster must decide on port allocation and whether to install toll-free lines for users.

A centralized telecommunications switch which may facilitate telecommunications among clusters, between and among clusters and standalone circulation (or online catalog) systems, dial-up access libraries, and users was discussed earlier. One switch could service the entire state, or several switches could be installed to serve geographic areas.

1.11.5 Clusters and other components of the network are encouraged to explore the establishment of a centralized telecommunication switch. Details of this activity have been discussed earlier.

2.0 Facilitate existing document request and delivery procedures.

As access to the information resources of the Commonwealth's libraries improves, the need for more efficient and effective methods of requesting documents for loan and ensuring their timely delivery increases. The ability to locate materials more quickly has raised user expectation of actually receiving these materials without delay.

Libraries need interlibrary loan to supplement their own collections in order to meet the informational needs of their local patrons. And patrons want interlibrary loan. In a survey of library users and non-users on Cape Cod, 97.2% of the users said that a library should provide interlibrary loan, while 91.2% of the non-users expressed the same opinion.[27] On the days when in-library surveys were conducted, 4.6% of the patrons had asked the library to borrow materials from other libraries.[28] In another user survey in southeastern Massachusetts, 30% had requested an interlibrary loan at least once during the preceding three months.[29] Patrons attach a time value to interlibrary loan - 73% of those surveyed are not willing to wait more than 10 days for an item requested from another library.[30]

In many instances interlibrary loan turnaround time - that is, the time elapsed from the patron's request to the time the material is received at the borrowing library - is painstakingly slow because several problems inhibit the process. Massachusetts is not unique or alone - interlibrary loan throughout the United States has problems.

One of the most commonly cited problems is the amount of time consumed in the interlibrary loan process itself. A brief examination of one example of the interlibrary loan process may help identify bottlenecks. First, the user requests an item a cluster library does not own. The item requested is located and an owning library identified in a database which simultaneously ascertains availability status, either by the user via a public access terminal, or by the librarian through a cluster terminal. Or the librarian searches a bibliographic utility without being able to immediately determine availability. If the item is not found electronically, other searching methods are employed, and not considered here. Once the item is located, the librarian must request the item from the owning library. If electronic requesting exists, a message is sent. If not, a telephone call may be placed, or an interlibrary loan request form mailed to the owning library.

So far, three bottlenecks have been uncovered. The first involves the the user's library. If the cluster library does not have public access

catalogs, the user may only search the library's card catalog. When the user requests loan of the book from another library, the librarian may conduct an intra-cluster search with the patron present, take the request for searching later in the day or pass the request on to another staff member. If the item is not located within the cluster, the next database checked may be a bibliographic utility or possibly another cluster or a standalone circulation (or online catalog) system. The interlibrary loan process will slow further if availability status cannot be ascertained, or if electronic ILL messageing is not used.

In the next step, the owning library processes the request. If the item is immediately available, the item is retrieved from the shelf, processed, and sent to the requesting library. If the item is loanable and not in, the item may be put on reserve, the request may be returned to the requester, or forwarded to another library to fill. The three bottlenecks are obvious. First, the supplying library must process the request. This could take time because of understaffed libraries and overwhelming workloads. A second delay would occur if the item were not immediately available for loan and the request was either returned, forwarded, or reserved. A third delay may occur in sending the item. The item may be sent by mail, delivery system, or other means which at some point during its journey uses a motor vehicle.

In many cases, the interlibrary loan is processed promptly. The user borrows the item and the information need is met. In other instances, the item is not received for weeks.

Another problem with interlibrary loan hinted at above is insufficient staff to accommodate all of the requests received. Interlibrary loan is increasing in Massachusetts, and most libraries are not adequately staffed to process each request as it is received. While many libraries want to be "good resource sharing partners", interlibrary loan is becoming a burden. Further, as more libraries contribute their holdings to machine-readable databases, and those databases become more accessible to more libraries and users, interlibrary loan will continue to increase.

A third problem deals with intrastate document delivery, especially among libraries of different types. The regional public library systems have operated a motor vehicle document delivery system for its member libraries for years. A few library consortia, composed primarily of academic libraries, have their own courier/document delivery systems. Legislation passed in 1985 allows the regional public library systems to provide services to non-public libraries. In 1986 the Eastern Massachusetts Regional Library System began to provide delivery services to several non-public cluster libraries. Unfortunately, many non-public libraries do not have access to an intrastate document delivery system.

The Eastern Region's effort is commendable. However, it has not meet all of the document delivery needs of the clusters and their membership. Interlibrary loan among cluster members has increased, in some places, over 200% in three years. The regional delivery system is having difficulty keeping up with the increasing volume. Cluster members want more support from the regional systems to meet their interlibrary loan needs. Daily delivery with two delivery systems in operation service has been suggested - one system for intra-cluster document delivery and another for non-cluster members, with at least one library as an intersection point between the two routes.

Further, non-cluster libraries want increased access to cluster databases directly by using dial-up procedures or indirectly through the regional systems. All regional system libraries have access to a cluster - so, technically, all Massachusetts public libraries have access to a cluster. Requests from non-cluster libraries for materials in cluster libraries will increase the volume of interlibrary loan requests. The document delivery system will become further burdened. It is important that the regional public library systems, the clusters, and cooperating standalone circulation (or online catalog) systems (as appropriate) work together to seek solutions through the annual Plans of Service.

Inadequate planning for interlibrary loan may cause overwhelming problems. There have been few studies conducted about the overall interlibrary loan load, especially document request and delivery procedures. Information about procedures, recommendations, and alternatives are needed for careful consideration in planning.

2.0.1 The interlibrary loan and information transmission process, including identification of bibliographic items, document request procedures, the handling of the request by the owning library, document delivery, and the return of the document to the owning library should be studied in order to increase effectiveness and efficiency. Library cooperatives, consortia, clusters or the regional public library systems may request funding, as available and appropriate, administered by the Board of Library Commissioners, to examine all or part of the interlibrary loan and information transmission process.

Despite these problems, interlibrary loan is proceeding throughout the state. The regional systems are trying to cope with the volume and the demands. Those libraries using OCLC as a bibliographic utility seem pleased with the responsiveness of the interlibrary loan system. And clusters are sending requests electronically even though several systems lack a functional electronic mail/interlibrary loan component. While the interlibrary loan process could certainly be improved, it has not come to a grinding stop.

It is frustrating to librarians and patrons that items can be located (with owning libraries identified) seemingly instantly, but not delivered promptly. Automated access to informational resources may be of little use if the item needed cannot be requested and delivered in a timely manner.

2.1 facilitate document request procedures

The most efficient manner in which to transmit an interlibrary loan request is by sending a request electronically to the identified owning library. Whenever possible, libraries should submit interlibrary loan requests in an electronic format. There are several advantages of using electronic means for document requests:[31]

a. ILL requests can be sent and picked up in minutes rather than the days required for mailed requests
b. staff time needed to process ILLs is reduced. Telephone requests that interrupt the library's workflow by requiring a staff member to write out an ILL request will be less

frequent.

c. typed ILLs should improve accuracy over handwritten or verbally transmitted requests
d. libraries which have refused telephone ILL requests in the past may be responsive to electronically transmitted requests because frequent telephone interruptions for rush requests will be eliminated and a record of the transaction will be made automatically
e. electronic mail is less expensive to process and send than mailed requests

Bibliographic utilities already utilize electronic messageing to send and receive interlibrary loan requests. In the OCLC interlibrary loan subsystem, the requesting library identifies up to five owning libraries where the request may be sent. If the first library does not have the item on shelf, or it is not loanable, the request is forwarded to the next library. This function has been successful and is heavily used, as can be attested to by many Massachusetts libraries. OCLC also offers gateways to other databases, such as reference/source database services, as an option in their electronic mail system. Libraries participating in regional or State OCLC/NELINET GACs may also use the electronic mail system to send interlibrary loan requests to other GAC participants. All bibliographic utilities should offer electronic interlibrary loan requesting to be considered as such.

Intra-cluster interlibrary loan should be the most efficient and effective of all request processes.[32] The ability to identify the owning library as well as to ascertain availability status should facilitate the interlibrary loan process since requests, in most cases, will be sent to only those libraries indicating ownership and immediate availability. If electronic messageing were available through the circulation/ILL control system, interlibrary loan requests could be sent electronically to the owning library, shortening the interlibrary loan turnaround time, and getting the item to the patron faster.

Unfortunately, not all clusters have a fully-functional electronic mail system for interlibrary loan. All clusters should have intra-cluster electronic mail systems which can be used for interlibrary loan messageing. It is also desirable to have a separate interlibrary loan messageing subsystem of the electronic mail system. For example, after an item has been located and the target library identified, the librarian (or user) should be able to request an electronic interlibrary loan request form. The form is filled in on the screen, and sent to the owning library's mailbox. Having an interlibrary loan form available online would establish a standard format for each interlibrary loan request rather than using a "memo" format in an electronic mail system. In addition, having a separate ILL form would differentiate a request for material from all other electronic messages a library may receive in a day, and would facilitate its prompt handling.

2.1.1 Clusters which receive funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with acquiring and/or upgrading the hardware

and/or software of the central site computer system should have an intra-cluster electronic mail system usable in the interlibrary loan process available within the computer system. Use of bibliographic record formats as messageing units is not acceptable as an electronic mail system.

Inter-cluster electronic interlibrary loan requesting is much more difficult because of the many differences in vendor systems. For inter-cluster communications involving like systems, the electronic messageing systems in place on the central site computer systems should be functional. Electronic interlibrary loan request between disparate systems is encouraged, but may have to wait until the Linked Systems Project and other computer-to-computer protocol and technical solutions are more fully developed before it becomes reality.

Electronic messageing for interlibrary loan requests between cluster libraries and non-cluster libraries may take several different forms. One of the more common intersection points will be bibliographic utilities. With cluster holdings in the utility's database accessible to non-cluster libraries, and with the cluster's access to the database for non-cluster items. interlibrary loan requests can be conducted through the utility's electronic mail system. Libraries having dial-up access to search a cluster's bibliographic databases for needed items will probably be able to utilize the cluster's electronic mail system to place interlibrary loan requests, and to receive requests from member libraries if the dial-up access library's holdings have been converted through the cluster.

Two other alternative systems may be utilized for electronic interlibrary loan requests. Telefacsimile machines have been used to transmit interlibrary loan requests. In at least one instance reported in the literature, using telefacsimile to send the request was preferred over electronic mail since the the latter involved going to the terminal, entering passwords, and typing the text online. It was also preferred because some of the recipients did not always read their mailboxes more than once a day whereas a telefacsimile transmission generally did not sit in a mailbox as long.[33]

Telefacsimile interlibrary loan requesting does not appear to be a cost effective alternative to electronic mail. Telefacsimile machines are costly to acquire, maintain, and to use because of the telecommunications costs. A telefacsimile machine can only communicate with another telefacsimile machine. Therefore, a machine at each end of the interlibrary communications line is necessary. There are fewer and fewer instances when a telefacsimile machine is needed for requesting an interlibrary loan. With many libraries involved in a cluster and/or bibliographic utility, and many others dialing into a cluster, there will be fewer and fewer libraries without some manner by which to transmit an electronic interlibrary loan request. The advantage of telefacsimile is document delivery, not document requests.

Another alternative is to use a common electronic mail system

which is accessible by any library with a computer system or a microcomputer. As has been stated, intra-cluster, intra-bibliographic utility, and probably dial-up access library and cluster electronic interlibrary loan requests can be handled with existing electronic mail systems. However, there are few practical systems for inter-cluster electronic mail between disparate cluster systems. And there are hundreds (maybe thousands) of libraries of all types in Massachusetts not involved in a cluster, a bibliographic utility, or as dial-up access libraries (for this discussion, these libraries will be referred to as "unaffiliated"). However, these unaffiliated libraries have a need for an electronic mail system for resource sharing purposes. First, as databases on CD ROM become available for acquisition by many libraries, more interlibrary loan requests will be forthcoming from the unaffiliated. Without a common electronic mail system, the requests will have to be sent by mail or telephoned into the owning library. Also, these libraries may want to attempt blind interlibrary loan requests (the request is sent out to a library "likely" to own the item) despite the uncertainty that the library owns the desired item.

Because of the number of members, and because it was designed for libraries, it is recommended that the American Library Association's ALANET system become the common electronic mail system for Massachusetts libraries. ALANET offers an interlibrary loan facility so that requests can be directed toward any other ALANET member. Further, ALANET offers gateways to other databases including reference/source database files, and also provides timely information concerning professional activities. Any library with a microcomputer, modem and appropriate communications can access ALANET. MEDLINK is a Massachusetts library consortium brokering ALANET services in Massachusetts.

2.1.2 It is recommended that ALANET become the common electronic mail system for Massachusetts libraries. It is recommended that clusters develop gateways for members to access ALANET from their central site computer systems. It is suggested that bibliographic utilities also develop gateways to this important library electronic mail system.

The Board of Library Commissioners will consider, on an annual basis, depending upon the availability of State funds, requests from libraries to join ALANET. Funding administered through the Board of Library Commissioners may only be used for initial start-up costs associated with joining ALANET; requests for the purchase of equipment, software, or a service which meets the needs of an individual institution will not be considered appropriate. Libraries participating in this program must agree to utilize ALANET for resource sharing purposes and must pay for all other costs for a period of not less than two years.

A costs study should be conducted on whether ALANET membership and services should be obtained through MEDLINK as a broker, or ALANET directly.

It should be emphasized that the recommendation to utilize ALANET is not intended to replace electronic messageing systems in place or planned for in the clusters, bibliographic utilities, or between libraries. Using ALANET is recommended as a communications means between clusters not utilizing the same bibliographic utility, automated circulation control system or electronic messageing system, and between libraries without access to any electronic messageing system or the same electronic messageing system used by other libraries. However, when the need arises for an electronic messageing system where one does not yet exist, it is recommended that ALANET be considered before developing/establishing a new system.

2.2 facilitate document delivery procedures

The document delivery mode chosen to fill a request should utilize the fastest, least expensive, and most reliable means of information transmission available. In many cases, information resources can be identified, located, and frequently requested electronically. Most often, however, document delivery, the physical delivery of the information or the item desired, is not conducted electronically.

There are many document delivery procedures in place in the state. The regional public library systems operate a motor vehicle document delivery system among their members and are allowed by law to offer the service to non-public libraries. Several library consortia operate courier/delivery services among their members. One of the most frequently used document delivery systems is the U.S. Mail because it goes everywhere, and because of the low cost of shipping items via library rate. Another frequent mode of document delivery is the patron who travels to the owning library to borrow the item directly, bypassing, depending upon how the supplying library handles the loan, the interlibrary loan process.

All three of these document delivery systems have inherent delays and/or other problems. Heavy on-site borrowing from outside of the library's primary clientele causes a burden on a library not funded to provide an increased volume of service. Although inexpensive compared to first class postal rates, library rate may also be blamed for some of the delay in receipt of materials experienced by libraries because the post office handles it as a low priority. The regional public library systems deliver an ever increasing volume of materials. Demand for services is also increasing. Cluster members are conducting regional interlibrary loan activities through their computer systems and expect regional support of their resource sharing efforts. In addition, cluster libraries want to expand document delivery to non-public libraries and to increase the frequency of delivery days. A possible solution may be for the regional systems to operate two document delivery routes - one for cluster members and another for non-cluster members - with at least one intersection point (library) between the two routes. Another suggestion offered would have the regional system contract with a commercial service to provide document delivery. Such an alternative has been used, with much success, in Pennsylvania for years and has proved to be

cheaper than using the mail or United Parcel Services (UPS).[34] The regional public library systems, the clusters, and cooperating standalone circulation (or online catalog) systems (as appropriate) should cooperatively identify needs, consider issues such as budgeting, and develop recommendations on how to improve document delivery services and information transmission.

Some libraries are beginning to consider the merit of obtaining documents from a commercial documents provider rather than through the interlibrary loan process. The cited advantages are that all costs are borne by the borrowing library, the turnaround time may be reduced, and the hassle of keeping records for copyright purposes is eliminated.[35] Most of these commercial documents providers depend wholly or partially upon full text electronic databases to meet users' requests. Full text databases are just that - the content, as well as the citation to the content, is available online in realtime. Users need only identify which sources they need, and the full text can be downloaded to their computer immediately or printed out and sent to the requester within a few days. Commercial information vendors such as DIALOG and Information Access Company see full text files as a document delivery mechanism.[36]

Other existing or developing forms of full text databases seem to be encompassing two trends. One concerns storage and retrieval as a product of publishing. The other is a trend toward transmitting information directly to the individual's home or business.[37] Electronic publishing, in its pure sense, is a far more radical service than document delivery. In electronic publishing, the computer network becomes the primary medium for the creation, storage, and dissemination of a document. Among the advantages of electronic publishing are the low cost of creating and storing information, and the ability to retrieve relevant portions of that information selectively.[38] Some publishers have begun to make journals available in full text online (the Harvard Business Review, for example) and there is a movement to make more journals available in full text online.[39] This could work to the advantage of many libraries, especially those with space and/or budget limitations. Rather than acquiring journal subscriptions for infrequently used sources, the library could purchase only those articles requested by patrons. In the long run, this practice may save funds in materials budgets, and it will certainly save shelf space and processing costs.

The other trend, to transmit information directly to the individual's home or business usually involves teletext and videotex systems. Videotex utilizes coaxial cable, fiber optics cable, microwave or satellites to link the home or office to a remote computer which stores information. The searcher, in a two-way interactive mode, queries a desired file and requests information transmitted to a television, terminal, computer screen or some other receiver. Teletext is designed for limited information retrieval and is active in one direction.[40]

A videotex system could provide remote access to the library's online catalog, community calendar, information and referral file, or other databases to locate and deliver information.

information could be delivered almost anywhere outside of the library. Libraries which have the opportunity to work with videotex (or are even limited to teletext) should develop for themselves, or in coordination with their local agencies, new information files and make existing files available electronically.

Full text databases are not, at this time, an all encompassing solution to the need for document delivery in libraries. The more immediate reality is that many libraries are interested in more efficient and faster means of document delivery, at a time when full text online databases and other advanced technologies such as videotex are only beginning to address those needs.[41] The only currently promoted technology which could be identified to assist in the actual physical transport of materials is telefacsimile.[42] However, telefacsimile may be viewed as only an interim step and may become a technological dinosaur when full text databases become more readily available.[43]

Facsimile relays alphanumeric characters and graphics to distant sites across standard telephone lines, private transmission lines, or in some cases, microwave relay systems and satellites. A facsimile device can be thought of as a type of copier that electronically sends the image of the original document to a remote location, where it is reproduced as a copy or "facsimile" of the original.[44] It is usually referred to "telefacsimile" when telephone lines are used as the transmission medium.

Most of the older facsimile machine were analog devices, operating on light and dark differentiations to transmit and reproduce the image. These machines took as long as six minutes to transmit a single page. However, newer digital machines based on CCITT's (the Consultative Committee for International Telephone and Telegraph) Group III standards transmit a page in 15 to 60 seconds. This dramatic increase in speed of transmission makes the cost of sending pages, even at long distance telephone charges, comparable to the least expensive of the document courier services.[45] Group IV standards which are expected to be completed in late 1987 or early 1988 will produce even faster machines, connect directly to computers so that electronic files can be transmitted without need for a paper copy, and have store and forward facilities for electronic mail.[46]

There are several costs associated with the operation of telefacsimile equipment - the cost of the equipment itself, continuing equipment-related expenses such as maintenance and supplies, and telecommunications. Essential features of machine functions include: automatic feed; unattended operations, including the capability to record all machine activity; and automatic dialing and batch transmissions at preselected times.[47] Currently, each page must be copied from the original bound volume prior to transmission because the page to be transmitted must lie flat on the machine. A highly desirable feature would eliminate the step of having to make a photocopy of the page to be transmitted. A library staffer could stand at the machine and transmit each page from the original bound volume.

The short-term prognosis for telefacsimile is promising. A facsimile project in Illinois demonstrated that the availability of facsimile increases interlibrary loan activity. At an average of five pages per document, the costs ranged from $1.36 to $2.94 per document. The average turnaround time to request and receive and item by telefacsimile was 4.25 hours. The average time to request the item by phone and receive it by telefacsimile was 6.82 hours. It took two days to request it by phone and receive it by a library delivery system, and it took over four days to request the item by telefacsimile and receive it via the delivery system. The average time to request the item by mail and receive it in the delivery system was almost six days. The average cost to purchase the requested item exceeded nine dollars and took no less than seventeen days.[48]

Telefacsimile is not the total solution to document delivery. It requires that all participants have a facsimile machine and the internal resources to support the activities. Certainly telefacsimile has a role in resource sharing and interlibrary loan which should be identified and examined. Telefacsimile may work best for short length documents which have been identified through union lists. The process becomes cheaper per document as volume increases. It may be the best tool in the document delivery process until availability of full text databases becomes widespread.

2.2.1 Library consortia may request that the Board of Library Commissioners consider requests for funding, as available and appropriate, for pilot projects to demonstrate the applicability and functionality of telefacsimile for document delivery. Pilot projects cannot involve more than twenty-five percent of the consortia membership. Projects should be based upon the employment of an existing union list(s) to identify and locate requested items. Funds may be allocated for acquiring equipment only and cannot be utilized for operational, telecommunications and maintenance costs. Projects must run for no less than two years. Equipment must be returned in working order to the Board of Library Commissioners if the project operates for less than the two year period. Extensive cost and usage evaluations of the progress of the pilot project will be required. The Board of Library Commissioners will consider requests for funding to expand successful pilot projects after the pilot project has terminated and evaluative data has been submitted for review.

The problems surrounding document request and delivery must be solved in order to improve services to patrons. It is not enough to create access to the machine readable databases which represent informational sources. Informational sources must be requested and delivered to patrons in a timely fashion. More effort must be made by cluster members, consortia, members of the regional public library systems and other libraries to identify and specify problems, recommend alternatives, and effect changes. Member of the regional public library systems are again reminded that the annual Plan of Service is the appropriate mechanism for introducing and implementing changes in services.

Further, the interlibrary loan process must be kept simple. Patrons should be allowed and encouraged to expand their participation in the process, ultimately reducing the library's resources needed to conduct an interlibrary loan. For example, public access catalogs in cluster environments allowing a patron to search the holdings of all cluster participants for desired sources, to generate a hold on an item owned by another library, to request it electronically, and to establish a "reserve" for it once it arrives from the supplying library would facilitate the interlibrary loan process.[49]

3.0 Develop an ongoing education program on resource sharing.

Education is important in any automated resource sharing effort. Many of the planning and other skills necessary to initiate and implement automation projects are not included in the curriculum of graduate library science programs. Further, introducing and applying automated technologies alters the internal operations of all libraries, and staff must be continually trained about new procedures and functions.

Librarians need training for various activities at various levels. Libraries using microcomputers for dial-up access into cluster databases have different informational and training needs than cluster libraries introducing public access catalogs. Some librarians have little or no experience with computers, or automated resource sharing and need introductory information before beginning to work with specifics. There is also a need for informational workshops for trustees, library governing officials, and other administrators to introduce, explain and demonstrate the numerous concepts and alternatives.

Further, there is a need to meet the specific educational needs of library staff by taking advantage of educational technology. For example, circulation staff in cluster libraries are always changing. Rather than having the systems vendor provide live (costly) training for new staff members, a training session could be videotaped and then played for new staff as necessary. Some librarians are not participants in automated resource sharing activities because they cannot leave their libraries or travel very far to attend informational workshops. Again, videotaping the workshops for latter dissemination to those who want to view the tape is a possible alternative. Or workshops could be transmitted to remote sites using teleconferencing technology so that the librarian may experience, and maybe even participate in the workshop as it occurs.

There is need for ongoing education, and there are many possible providers, including professional associations, the regional public library systems, the Network Advisory Committee, and educational institutions. Continuing education needs should be assessed, existing and potential providers identified, and a coordinated effort made to develop and deliver quality programming.

3.1 The Network Advisory Committee should conduct a continuing education needs assessment of issues related to resource sharing, identify potential providers, and coordinate an education program with those providers to increase the opportunities for librarians, trustees, library governing officials, and other administrators to become more familiar with automation and resource sharing activities.

3.2 Library consortia may request funding, as available and

appropriate, from the Board of Library Commissioners to conduct educational programs about issues concerning resource sharing and/or automation. Such programs should be conducted without attendance fees for participants (costs for necessary materials for individual use, such as workbooks would be allowable). Further, the consortium should be able to reproduce the program on videotape and/or make the program available to remote sites using teleconferencing techniques.

3.3 A library consortium may request funding, as available and appropriate, from the Board of Library Commissioners to conduct training and/or continuing education programs for its membership. Such programs should be of such content and scope as to be of interest and utility for other library consortia in the state, and should be available for dissemination via interlibrary loan at no charge.

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11. STANDARDS

Standards are necessary in any cooperative effort. In the automated resource sharing network, standards will be adopted to facilitate the coordination of resource sharing in a network environment by ensuring compatibility.[1] It is acknowledged that when accepting standards, there is a certain loss of local autonomy; however, this loss of autonomy is compensated by greater access to materials outside one's own collection. Furthermore, there is a cost to following standards. However, there is also a cost to not following standards - costs in duplication of effort and in failing to receive the benefits from resource sharing.[2]

Bibliographic control consists of those activities which are necessary to create and organize records identifying and describing library materials. Cataloging items utilizing cataloging codes, arranging items and records for retrieval, and creating the record structure are some of these activities.[3] If the objective is to share resource access points (clusters, libraries dialing-into a cluster, participants of bibliographic utilities, etc.), a method of communicating bibliographic data is needed. By standardizing the structure, content designation, and data content of the records, a high degree of compatibility can be achieved.[4]

Increasingly, since 1968, the MARC II format has become the predominate basis for machine-readable bibliographic information in cataloging systems. MARC is used here to refer to all of the individual formats.[5] Bibliographic control for the network should be based upon standardized cataloging rules (currently AACR2) and compatibility with the U.S. MARC format of the Library of Congress. Machine-readable bibliographic records produced by a bibliographic utility should be consistent with AACR2 and U.S. MARC for any library using the utility or its bibliographic service center. Bibliographic database files on circulation/ILL control systems should utilize these standardized cataloging rules and record format. Cooperative library groups receiving funds from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install a system that supports AACR2; accepts, retains, and outputs records in the U.S. MARC format; and can support necessary bibliographic authority control. Libraries receiving funds administered through the Board of Library Commissioners to access the clusters' bibliographic databases should agree to convert their ongoing acquisitions utilizing the U.S. MARC format and AACR2.

Standards for holdings statements are being completed to facilitate communications between systems. Simply linking bibliographic records is not adequate if the holdings information is not understandable and complete, such as in the case of serials. Resource sharing cooperatives should adopt these standardized holdings statements as they become available and strongly encourage vendors to incorporate the standards into their systems.

Elements of the interlibrary loan request form should be agreed to in the cooperative agreements between clusters, between a cluster and those libraries using dial-up means to access the cluster, and between other access points as necessary. Because it is recommended that interlibrary loans be requested in an electronic format, it is further recommended that a standard electronic interlibrary loan form be adopted or developed which can be used in all resource sharing situations. The exception would be for those requests generated within a bibliographic utility which already

has an electronic interlibrary loan request facility in place.

The use of telefacsimile in Massachusetts libraries as a alternate mode for document request and delivery will increase during the next several years. Compatibility between machines is critical to the successful transmission and receipt of information. To ensure compatibility between machines of different manufacturers, the Consultative Committee for International Telephone and Telegraph (CCITT) has developed telefacsimile standards. Group I machines use analog transmission at six minutes per page, while Group II can transmit and receive at three minutes per page. Group III is subminute, digital telefacsimile transmission. Because of the better quality and considerable telecommunications savings of using digital transmission technology, it is recommended that libraries desiring telefacsimile capability acquire CCITT Group III equipment with downgrade compatibility to at least Group II to be compatible with the facsimile being used in other libraries.[6]

CCITT is also developing standards expected in 1988 for the Group IV machines. Group IV telefacsimile machines can be directly connected to microcomputers eliminating the need for interface boards and software currently available in the marketplace, work with multiplexed digital networks and asynchronous networks as well as conventional voice-grade analog telephone lines, transmit a page in six seconds, and use plain bond paper instead of specially-coated paper. It is recommended that Group IV standards be adopted as soon as CCITT releases them, and that consideration be given to acquiring Group IV machines as economically feasible.

Massachusetts has been successful in its efforts to facilitate interlibrary cooperation by encouraging libraries to participate in resource sharing efforts based upon automated circulation/ILL control systems. Because the clusters have acquired systems that meet their membership's technical and financial needs, there are many different vendor systems in place throughout the state. Although systems of the same vendor can usually communicate with each other, disparate systems have difficulty in exchanging information because of differences in hardware, software, and data format. Therefore, to have two disparate systems communicate requires the development of special procedures and software. Unfortunately, if a third system is added, the procedures and software will more than likely need to be re-written to accommodate the requirements of the newcomer.

To solve this problem, the International Standards Organization (ISO) developed a standard telecommunications model to govern the communication of information between disparate systems. Called the Open Systems Interconnection Reference Model (OSI), systems of different types can communicate with each other by implementing the necessary layers of the model. The Linked Systems Project (LSP) hosted by the Library of Congress uses the completed standards from the ISO and the National Information Standards Organization, and drafts of standards yet to be approved. In the computer to computer scenario of LSP, a user of System X can search the files of System Y from a System X terminal using System X search procedures.[7]

The first applications of LSP in production will facilitate communication of bibliographic information between the Library of Congress, Western Library Network, Research Libraries Information Network, and OCLC. LSP will join with other library standards (MARC[8] and AACR2) as the essential enabling ingredients of library cooperation.

There is a need in Massachusetts to link the various circulation/ILL control system in order to facilitate resource sharing. If clusters implement the protocols from LSP, librarians and library users will be able to search the bibliographic databases of the numerous clusters to identify the wanted sources, and to ascertain availability status. Such information should decrease the turnaround time of the interlibrary loan process. Several vendors are planning to implement the protocols from LSP, and full recognition and support of these protocols will encourage its development. Therefore, cooperative library groups receiving funds after July 1, 1989 from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install or upgrade only those systems which have successfully passed the compatibility tests conducted through the test facility hosted by the Library of Congress.

Standards utilized within the network will be evolutionary as the technology and the network develop. The Network Advisory Committee and Board of Library Commissioners' staff will continually monitor standards policies and operations.

ENDNOTES

1. Barbara Evans Markuson, "Revolution and Evolution," p. 24.
2. Henriette D. Avram, "Governance of Library Networks," p. 223.
3. Sally H. McCallum, "Role of Standards in Networking," pp. 376, 379.
4. Paul B. Lagueux, "Standards for Networks," p. 181.
5. Dennis Reynolds, Library Automation, pp. 372-3.
6. Judy McQueen and Richard W. Boss, "High-Speed Telefacsimile in Libraries," p. 21.
7. Ray Denenberg and Sally H. McCallum, "RLG/WLN/LC Computers Ready to 'Talk'," pp. 400-2.
8. Richard W. McCoy, "The Linked Systems Project: Progress, Promise, Realities," pp. 33, 39.

12. FUNDING

Limited availability of funding for network operations is one of the major barriers to resource sharing in Massachusetts. The financial basis of the network components will be a combination of 1) local, state, and federal funds and 2) revenues generated by membership and cost recovery/reimbursement fees.

The most successful resource sharing cooperatives are those in which member libraries have made significant commitments with funds from their operating budgets and which view the cooperative services as an integral part of their essential operations.[1] Local funds should be provided for library participation in the automated resource sharing network because it is more cost-effective than is the effort toward self-sufficiency. In many instances dollars are being reallocated within library budgets to buy access to collections of materials owned by other libraries.[2] Funding network operations becomes workable when the library recognizes its role and begins to view finance as the fuel for the network, not its chief stumbling block.[3]

This document is intended to serve as a guide to updating and supplementing the Long Range Program 1987 - 1991 which is used by the Statewide Advisory Council on Libraries and the Board of Library Commissioners when recommending and considering requests for federal funds administered through the Library Services and Construction Act (L.S.C.A.) In addition, the objectives and tasks included in the Long Range Program are also applied in the majority of cases when recommending and considering requests for state funds made available for library projects through competitive grants.

Capital Costs

The initial establishment of network access points (shared circulation/ILL control systems and microcomputers for dial-up access to clusters) may require considerable capital funding for hardware, software, site preparation, and other associated costs. Adopting computer technology requires significant changes in library budgeting. The major problems are finding the needed capital and convincing library funders that capital investment is necessary.[4] Lack of capital is likely to be an increasingly difficult problem because of limited financial resources, and because the annual budget process enforces spending within a fiscal year and impedes accumulation of funds for future capital gains.[5]

It is important to differentiate between capital costs needed to establish a cooperative service and the capital costs incurred by a local library to access and utilize the service. A couple of examples may illustrate the point. In automating a union list of serials, a cooperative needs: a terminal or microcomputer to access a utility database in order to convert holdings records to machine readable format; the personnel to enter the holdings and to edit the records; and the production of the actual union list in print, microform, or another format. In some cases, participants must purchase hardware, as appropriate (such as a microform reader), to utilize the union list.

The establishment of an automated resource sharing cluster requires: preparation of a central site computer room; acquisition and installation of central site hardware and software to run the automated functions

desired; installation of telecommunication lines and equipment; and training for central site and remote library personnel. Centralized capital costs may exceed one million dollars, depending upon the size and needs of the cluster as a whole. Capital costs for the local library include: bibliographic record conversion, item conversion, patron file conversion and piece conversion; acquisition and installation of terminal and telecommunications equipment and lines; terminal site preparation and personnel training. A small public library can expect to expend at least $20,000 in capital costs for the first year of the project; medium and larger libraries may expect higher first year capital costs.

Cooperatives should calculate total capital and ongoing costs projected over a period of not less than three years, preferably five. It is important to determine the relationship between capital and ongoing costs. A less expensive initial capital cost may, over a three to five year period, require a higher ongoing cost than a more expensive initial capital investment. An example is the lease/purchase option. Leasing equipment can be attractive especially when first year capital outlay is less than to purchase the equipment outright. However, over a three to five year period, the sum of the annual lease costs may exceed the one-time cost of the capital acquisition many times over.

There are several sources of funding for capital costs related to automated resource sharing projects. The following table illustrates many of the capital costs associated with the services outlined in this document, and identifies appropriate funding sources. It is by no means an exhaustive list. "Federal" and "state" funds are directly administered, as available and appropriate, through the Board of Library Commissioners. "Regional" funds may, and have been, expended on automated resource sharing through the annual Plans of Service approved by the Board of Library Commissioners. "Local" refers to funding administered through, or on behalf of, individual libraries.

Capital Costs Item	Sources of Funding
union list of serials	
centralized costs	federal, state, regional, local
local hardware	local
reference/source database service	
hardware and software	state, local
training	state, local
telecommunications	local
database searches	local
shared circulation/ILL control systems	
central site computer hardware and software	federal, state, regional, local
central site telecommunications equipment	state, local, regional
installation of central site computer equipment	federal, state, regional, local
installation of central site telecommunications equipment	local, state, regional

central site room preparation	local
retrospective conversion	local, regional
item conversion	local
piece conversion	local
patron file conversion	local
remote terminals	local
remote telecommunications equipment - standalone	local
remote telecommunications equipment - shared	local, state
terminal site preparation	local
installation of remote telecommunications	local
training	federal, state, local
cataloging/ILL services	
terminals	local
telecommunications equipment	local
establishing and/or increasing access to a bibliographic utility	state, regional, local
establishing a centralized cataloging/ILL center for clusters	federal, state, local

It is difficult to establish a new cluster in twelve months or less. In at least three instances, capital federal funds administered through the Board of Library Commissioners to establish new clusters were not expended within the necessary twelve month period, although the funds were legally obligated. Federal law (the Tydings Amendment) allows funds from a single fiscal year to be expended during a two year period - the actual fiscal year (called the base year) and the immediate succeeding fiscal year (called the carry-over year). For example, federal fiscal year 1987 funds may be expended during the base year from October 1, 1986 through September 30, 1987 and the carry-over year from October 1, 1987 through September 30, 1988. Federal funds cannot be obligated after the carry-over year of the cycle.

For several reasons, including the actual timing of the allocation of federal funds from the U.S. Department of Education to Massachusetts and the planning and budgeting necessary to administer competitive grant rounds in the State, clusters have usually been funded during the carry-over year, leaving only a twelve month period for expenditure. Because of the difficulty in establishing a cluster in twelve months or less, it is recommended that the Board of Library Commissioners establish new clusters only during the base year of the two year federal funding cycle. Then, new clusters would have up to twenty-four months to establish themselves. This restriction does not apply to clusters being established with State funds or the expansion of existing clusters from either State or federal sources of funding.

It is usually more cost effective to expand existing circulation/ILL control systems to include additional members than to establish new clusters. New clusters require such capital costs as central site preparation and computer system hardware and software. Whenever it is technologically and economically feasible, capital funds administered through the Board of Library Commissioners should be applied toward expanding existing automated circulation/ILL control system clusters to

include additional libraries rather than to establish new clusters.

Clusters and other cooperative efforts based upon automated technologies should be encouraged to develop pilot projects which would explore the application of new technologies to expand or improve services, or which may result in improved cost efficiency and effectiveness. Such projects should truly be "pilot projects" - previously untried in Massachusetts and/or not previously funded through the Board of Library Commissioners. Further, these projects must be replicable in similar situations if successful. Clusters and other cooperatives may request capital funding, as available and appropriate, administered through the Board of Library Commissioners for pilot projects and programs.

Capital equipment acquired and utilized in automated resource sharing efforts is becoming obsolete more rapidly than ever, seemingly on the day it is installed. An equipment generation is now typically five years at the most, and it is debatable whether or not vendors will continue to support, or if individual vendors will still be in business, throughout the time the equipment is expected to be functional and operational by its users. Library cooperatives, especially the clusters, depending upon automated technologies to implement services should be budgeting for equipment replacement funds in their annual budgets. The prospect of having to close down an online public access catalog because a vendor no longer exists or will not support a particular function/application, and no funds exist for the cooperative to acquire equipment, could become a managerial nightmare for librarians.[6]

In the past, the majority of capital funds expended for automated resource sharing projects was made available through the federal Library Services and Construction Act. More recently, the Commonwealth of Massachusetts has expressed an interest in the benefits gained through automated resource sharing. The State Senate filed legislation in 1986 which included the establishment of a grant program and mentioned resource sharing as an eligible component. Fiscal years 1987 and 1988 funds were made available through the State budget for administering a competitive grant round for library projects. Several clusters and other resource sharing cooperatives received funding through the program. The Board of Library Commissioners and the library community should continue in their efforts to convince the General Court of the need for state funds in addition to federal funds for capital investment in resource sharing projects. Any funding administered through the Board of Library Commissioners for shared circulation/ILL control systems and other resource sharing projects is conditional upon the availability of funding, the appropriateness of the project or program, and the recipient agreements to meet requirements specified throughout this document.

Annual (Ongoing) Costs

Because of the financial unpredictability of categorical grants, local network participants must be responsible for the system's operational costs. Only those clusters and other cooperative efforts that can be maintained without grant money will be viable in the long run.[7] Local financial resources may be scarce; therefore, librarians should begin to think in terms of market creation and realize that improved services, if they are truly improved and desired by users, will inevitably create an increased market which will result in provision for increased financial support.[8]

Operational cost items will vary depending upon the resource sharing activity implemented. For example, a union list of serials project should continually revise its database to maintain the currency of holdings. This activity will at least require labor and a terminal. In addition, a revised printed union list, or a microform copy, will probably be produced annually. Clusters have significant operational costs. Participants' costs include local and central site equipment maintenance, the personnel to manage and administer the central site computer system, training costs for new staff or new functions, telecommunications costs, maintenance of the database either through local cataloging or centralized cluster cataloging (conversion), equipment insurance, retainment of legal services, supplies such as barcode labels and patron registration and charge-out cards, overhead such as electricity for the equipment, air conditioning and lights, and numerous other items and services.

The primary source of revenue for maintaining clusters and other cooperative projects will be membership fees paid by libraries from their operating budgets. Federal funds administered by the Board of Library Commissioners are not used to support ongoing operations. In one instance, State funds are specifically appropriated for the partial offset of clusters' annual telecommunications costs. State funds provided to the regional public library systems may be applied towards maintaining and/or operating any cooperative project, such as a cluster or a union list of serials, or for any purpose as determined in the annual Plans of Service and related budgets.

Several of the costs associated with automated resource sharing should be discussed in some detail. First, resource sharing is based upon telecommunications linking access points. The telecommunications between remote cluster members and the cluster's central site computer is primarily a local cost because it supports an essential library operation - circulation control. Responsibilities for telecommunications costs between clusters, and between libraries using microcomputers for dial-up access and clusters, should be specified in the cooperative agreements.

Telecommunications is essential to resource sharing, and it is one of the costliest ongoing operating expenses. The General Court included $200,000 in both fiscal year 1987 and 1988 State budgets for telecommunications costs incurred in the automated resource sharing effort. Funds were used to provide toll-free lines into the clusters so that non-cluster libraries with microcomputers could access the cluster's database to search for user-requested items, and for telecommunications costs associated with inter-cluster linkages. The balance of the funds were used to partially offset the telecommunications costs from the remote cluster library to the central site computer system. Although the funds were greatly appreciated, $200,000 does not go very far when there are at least twelve clusters with over 200 participating libraries and about seventy libraries using microcomputers to access the clusters. It is recommended that the Board of Library Commissioners request the General Court to increase the existing state funding level in order to reduce the costs associated with the telecommunications links within clusters, between clusters, and between dial-up libraries and the clusters.

Two closely related issues are interlibrary loan and document delivery. For public libraries, interlibrary loan and document delivery are usually viewed as two of the major responsibilities of the regional public library systems. Non-public libraries usually depend upon the U.S. Mail or a consortium courier service for interlibrary loan and document

delivery.

Over the past several years cluster members have stated frequently that the regional public library systems, specifically Eastern Region, should be providing more financial support since intra-cluster interlibrary loan was reducing the direct lending burdens of the regional contracting libraries. There was more lending of materials between cluster members than there was prior to the implementation of the cluster. As a result, the clusters were beginning to assume a role in the interlibrary loan activity that the regional systems are funded by the State to provide.

The issue of additional support for cluster operations is solvable through the regional annual Plans of Service. If member libraries agree that the clusters are assuming part of the interlibrary loan activities of the regional system, the Plans of Service can be used as planning/financial documents through which regional funds may be disbursed to the clusters for operational or other costs to support the intra-regional interlibrary loan function.

Many cluster members now find existing intra-state interlibrary loan and document delivery systems "slow" compared with the electronic speed of locating desired materials in other libraries. Further, the current regional document delivery systems are becoming overloaded with the volume of materials handled. Although Massachusetts General Laws Chapter 78 Section 19F allows for the regional public library systems to contract for provision of services with non-public libraries, this enabling legislation is not being tak n advantage of statewide.

Interlibrary loan and document delivery are essential to resource sharing in the State. Regional public library systems are encouraged to expand their delivery systems to non-public libraries, especially those involved in clusters. A revision of delivery routes may be an intermediate solution - establish a delivery system among cluster members, and another, less frequently-scheduled route(s) among non-cluster members. This would disperse the overwhelming volume of materials between two routes which should facilitate materials handling. Additional state funding for the regional systems will be necessary to dramatically improve document delivery Short term improvements may be possible by carefully planning routes and reallocating existing regional funds. However, it is beyond the scope and responsibility of this document to resolve document delivery issues in the regional public library systems. The issues of document delivery and information transmission should be studied. Then, after recommendations concerning funding, policies, procedures, etc. have been determined, changes may be introduced and implemented through the annual Plans of Service.

Two other cost issues related to interlibrary loan and lending exist. Increasing access to informational resources results in increases in interlibrary loan requests. Several libraries which have assigned interlibrary loan to one or more library employees as part of their job responsibilities are discovering that the volume of ILL has increased to the point that the time required for the activity is becoming a burden on the staff. In addition, with the capability of searching numerous other neighboring libraries' collections online in realtime, users are now more apt to drive to the nearby library which has the book on the shelf. Therefore, some public libraries experience an increase in the circulation of materials to non-residents users. As with the interlibrary loan process, non-resident use requires support and, in some cases, reallocation

within internal budgets for provision of service.

The Board of Library Commissioners has long recognized these issues created by resource sharing. Partial reimbursement to libraries which are heavily used for interlibrary loan and by non-residents is desirable. Existing state and federal programs administered through the Board of Library Commissioners are not appropriate for such reimbursements, and legislation is required to establish such a program. Therefore, it is recommended that the Board of Library Commissioners prepare legislation which would establish a state budget account for partial reimbursement to heavy interlibrary loan net lenders. Secondly, it is recommended that the Board of Library Commissioners continue to seek a state budget account supporting the legislation passed in 1987 which enables partial reimbursement of public libraries with substantial circulation of materials to non-residents.

Fees and Cost Recovery/Reimbursements

Other sources of operational funds for clusters and other resource sharing efforts are fees and cost recovery/reimbursement fees assessed to other libraries and to individual users. The issue of fees is continually debated within the library community, usually around the user's ability to pay and the library's role in providing free access into information resources wanted by any and all citizens. Following is a brief discussion of the issue and how fees and cost recovery/reimbursements may be applied in automated resource sharing.

There are several arguments for support of fee-based services to supplement free basic services:

1. Without fees, the library is limited by its budget to offering only those services for which the library can pick up the entire bill. Relaxing the library's stand on fees will give it more scope to offer a wider range of services.[10]

2. The support derived from fees will cushion the impacts of shifts in the level of institutional support.

3. The choices made by users willing to pay for services will provide librarians with a vitally needed form of visibility and feedback indicating which services are most valued and which ones are inefficient or useless.[11]

4. Only certain users actually need the services. Users should be given the choice of paying for the availability of the service rather than not having the service at all.[12]

5. A computerized retrieval system (usually a reference/source database service) is a special service and should not be equated with existing basic resources and services needed to preserve equality of access.[13]

6. The purchase of a book with its ensuing perpetuities, is thereafter available to many users and does not remain the property of the requester. However, the online information search is highly personal, usually of interest specific to the requester, and economically demands a much higher cost since it has no distributive characteristics.[14]

7. Libraries have often charged fees for some services, even if they were minimal, such as to reserve a book.

Opponents to fees argue that:

1. Free library service is an American tradition.

2. Users of public libraries will be doubled-charged since they already pay for services through taxes.[15]

3. If you concede that the right of access to information is essential in a free society, then having fees levied which discriminate against those unable to pay creates barriers that negate that right.[16]

4. Online information searching is not a new service; it is the same reference service which has always been provided but using new tools and some new methods.[17]

Surveys concerning fees and their impact are essentially inconclusive. A marketing study conducted in 1978-1979 in Pittsburgh showed that 84.1% of respondents indicated fees were not a main deterrent to accessing information sources. There was a tendency to accept fees for computerized literature searches (reference/source database services) more easily than for interlibrary loans. Public library users did not see fees as double taxation. Users stated that they pay fees for museums and parks as well as highways which are publicly supported utilities. It was also stated that services requiring fees are additional services which are rarely asked for by the ordinary public library user.[18] Another survey pointed out that demand decreases significantly when fees are imposed, even for those who have the ability to pay.[19]

A middle ground between proporents and opponents of fees includes 1) subsidy or support for libraries so that basic information can be provided free to users and 2) fees for services which are tailored to individualized needs.[20] Many libraries now impose restrictions on use of library resources for non-primary clients. Fees for basic public library services, such as entry to a library, a library card, or resource referral information, are practically, politically, and philosophically inadvisable. Libraries should provide a reasonable level of service to patrons at no charge. Additionally, public libraries must consider reciprocal borrowing and interlibrary loan as related to standing state aid statutes and regulations. Fees for services which were formerly free would be unpopular.[21] Fees may be acceptable for optional services for which patrons could substitute their own effort or time. Libraries have charged users for services where costs are readily identifiable such as for reserve notices, cost materials, or equipment rental.[22]

It seems that many libraries could continue to provide a basic level of free service supplemented by patron-specific special services available to the user for a fee.[23] The most common pricing scheme is for the library to absorb the indirect costs and pass along the costs incurred directly for the service.[24] For information retrieval (reference/source database) services, the typical charges are based upon the direct variable costs of the search which include database access and usage charges, and communication charges.[25] Some libraries also charge for the time required of the analyst/searcher.

People will pay for services if by using the service, they can save time. If the library does not save them time, they will go elsewhere. There should be no charge for basic services, nor should all user groups be expected to pay for specialized services.[26] However, it is preferable to offer a service for a fee rather than not offer it at all.[27] Fees should be used only to supplement support from the primary financial source, not supplant it.

Services between clusters, and between clusters and libraries using microcomputers to access cluster databases, can be cost recoverable/reimbursable subject to state and local laws and cooperative agreements. Being charged for loans can be a problem to libraries. What often occurs is that libraries will bypass those libraries charging for loans, thereby putting more stress on libraries with liberal lending policies.[28] It is unfortunate that libraries have a need to charge fees at all. However, it is an ideal situation in which a library borrows as much as it loans, and it is the reality of many institutions that fees must be charged.

There should not be fees for loans among cluster members: free reciprocal borrowing and/or interlibrary loan should be one of the benefits of belonging to the cluster. Clusters receiving funds from the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to free reciprocal borrowing and/or interlibrary loan among members of the cluster. Fees charged by the cluster to libraries using microcomputers to access the cluster's database should include interlibrary loan. The library should not be assessed an additional fee on a per transaction basis.

In other resource sharing instances, such as inter-cluster resource sharing, fees for interlibrary loan may be imposed based upon cooperative arrangements because the frequency and need for continuous cooperation with each other and/or the materials to be loaned may not be appropriate without cost. The fees should be reasonable and reflect cost recovery or reimbursement. Additionally, it is recommended that the fees be assessed against individual libraries, not the cluster as an entity, unless agreed to in the cooperative agreement. However, clusters and, for that matter, standalone systems should carefully consider the imposition of interlibrary loan fees, even on a cost recovery/reimbursement basis, when transacting among and between each other. A quid pro quo system of free interlibrary loan is desirable.

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13. GOVERNANCE

Governance, in the context of a library network, is concerned with the relationships among the participants and institutions with respect to accessing the informational resources, communication between access points, and document request and delivery systems.[1] In essence, governance includes the basic definition and continuity of the purpose and existence of the cooperative effort.[2] As such, governance is a political process in which the conflicting or, at least, divergent views of the participants are reconciled. The problem is that all the participants hold stakes which they may be willing to invest but are reluctant to lose. So the process of governance must recognize all the stakeholders and provide the means for reconciling their differences. The role of governance is to assure the preservation of diverse objectives while achieving jointly perceived objectives.[3]

It is important to distinguish between governance and management. Management is concerned with operational decisions used to achieve network goals and objectives. Governance permits those using the network to express their interests and concerns, and to establish goals and objectives as well as the policies by which goals and objectives are to be achieved.[4]

There are three instruments which provide the legal mechanism for establishing a library network;

1. a statute enacted by a legislative body,

2. articles of incorporation together with bylaws, and

3. a contract or series of interlocking contracts

and when applied as governance may yield:

1. governmental library network - created directly pursuant to a statutory mandate to act as agencies of their respective governmental level (federal, state, or local);

2. quasi-governmental library network - an independent entity created by statute, sustained by fees, and given specific powers; and

3. non-profit, non-stock, membership corporation library network - a separate legal entity, tax-exempt.[5]

4. formal agreements - formal agreements involving two or more municipalities to lease or purchase computer equipment to provide specific data processing services as authorized by Massachusetts General Law, Chapter 40, sections 4 and 4A.

A fifth type of governance structure without legal identity or status is the unincorporated association and cooperative, a collection of institutions joined together in an informal manner for a common purpose.[6]

The activities of a resource sharing cooperative are framed by agreements among the participants. Four basic kinds of agreements exist:

1. **an informal agreement** - mutual decision to cooperate, not binding

upon the participants, with the disadvantage of not providing a formal, unambiguous record of the agreement to cooperate;

2. **written agreement** - lists the activities in which members have agreed to cooperate (a written, enforceable agreement is especially needed if one library comes to depend on another, whether or not there is a transfer of funds);

3. **constitution** - states the purpose of the organization and enumerates the titles of officers and rules for membership; and

4. **articles of incorporation** - contains the same kind of information as the constitution, but is a more formal document that is filed with the state government and establishes the cooperative as a legal entity. Incorporation offers several advantages: it provides the cooperative with the rights and privileges of a legal body, makes it easier to enter into contracts, and fixes legal responsibility providing limited liability for the individual members. Incorporating as a non-profit organization has the additional benefit of tax exemption.

It is recommended that cooperatives formally organize themselves under articles of incorporation. Specifically, library cooperatives in Massachusetts should organize themselves as non-stock, non-profit corporations under Chapter 180 of Massachusetts General Laws. In addition, all library cooperatives should file for federal tax exempt status under Internal Revenue regulation 501 (c) (3). Library cooperatives wishing to be considered for funds administered through the Board of Library Commissioners for resource sharing projects should be established as a non-profit organization under Chapter 180, and cooperatives planning to purchase circulation/ILL control system central site equipment should additionally have federal tax exempt status.

Further, it is recommended that library participation in resource sharing efforts (such as circulation/ILL control systems, accessing a cluste. via dial-up, a union list of serials cooperative, utilizing a bibliographic utility, etc.) with other libraries, vendors, service providers, state government or others be based upon formal written agreements or contracts minimally defining individual and cooperative responsibilities.

The Network Advisory Committee has developed a checklist of "Points to Consider when Developing Cooperative Arrangements Among Libraries" (included in this document as an appendix). Library cooperatives are encouraged to use this as a guide when establishing or reviewing a cooperative's governance structure.

Public Libraries in Resource Sharing Cooperatives

Because of the nature of their relationship as part of a municipality, public libraries should consider the legal constraints of Massachusetts law when considering governance structures and agreements for resource sharing activities. It may be useful to consult with the local Town or City Counsel regarding governance issues before committing to a resource sharing project. This is particularly important for public libraries considering cluster membership.

Chapter 7[illegible] Section 11 allows the board of trustees of any Town to

enter into agreements with the board or boards of trustees of any neighboring library or libraries for the purpose of improving library services. Unfortunately, Section 21 forbids this arrangement to involve Cities. Section 11 provides trustees with authority over property within the Town limits. It does not authorize the sharing of costs for acquiring assets beyond the Town's political borders and does not authorize the trustees to contribute funds to participate in the governance of an entity. Therefore, Chapter 78 Section 11 does not authorize payment for equipment unless the equipment is owned by the Town purchasing the equipment.

Chapter 40 Sections 4 enables a City or Town to contract by a formal written agreement for specified services to be provided from outside of the municipality, data processing being one of those services. Section 4A goes on to allow Cities and Towns to provide services to one another. Chapter 40 clearly authorizes joint agreemants for the joint provision of services. However, it does not authorize the payment of funds to an independent entity for the purchase by that entity of equipment to be used in providing the service to the municipality. A municipality must act as fiscal agent for the purpose of owning the assets and providing the services to participating municipalities who then pay for the services.

Chapter 78 Section 11 does not authorize the library to contribute funds to or participate in the governance of an entity although Chapter 40 Sections 4 and 4A taken in conjunction with Section 11 of Chapter 78 would authorize the Town, acting by or through the trustees of the public library, to enter into agreements with other participating municipalities for the provision of, or receipt of, services specified in Section 4 of Chapter 40.

Chapter 180 allows for the establishment of a non-profit corporation. However, there is no authority provided to a municipality to become a member of a non-profit corporation. Therefore, there is no legal authority for a municipality in using public money to purchase assets which will be owned by a non-profit corporation. Libraries may, however, contract with a non-profit corporation for the purchase of services allowable under Chapter 40 Sections 4 and 4A.

Chapter 44 Section 53 requires that all funds received by a municipality must be duly appropriated. This could cause a problem for the municipal library acting as fiscal agent on behalf of a library cooperative which receives fees from other municipal libraries for the provision of services. By law, the City or Town must appropriate the funds necessary for the operation of the cooperative, and the municipality may determine that it will not do so, or may somehow interfere with the operations of the cooperative. Such interference could include the insistence of the municipality that another department, such as the Tax Collector, share the computer system with the libraries which could result in severely reduced computer response times. Fortunately, Chapter 44 Section 53 allows for special legislative acts that would enable a municipality to receive funds which would not have to be appropriated and which could be managed by the directors of the library cooperative. Both the Merrimack Valley Library Consortium and the Minuteman Library Network have received such authorization from special State legislation.

The result of such legal constraints apparently causes restrictions on capital acquisitions of library resource sharing cooperatives, especially for shared circulation/ILL control systems. It appears that libraries may not directly fund non-profit entities for the purpose of equipment

(capital) purchases including the acquisition, replacement, and/or upgrading of the central site computer system and/or network-held equipment. However, because the municipal library may contract for services, it may be possible for library cooperatives hosted by a municipality acting as a fiscal agent (and which has special legislation considering the provisions of Chapter 44 Section 53) to acquire capital equipment from service fees as long as the fees assessed by the cooperative to the municipal library are for services and does not specifically request funds for capital acquisitions. If a municipality receiving services from a cooperative determines that the service fees are too high, the municipality may choose not to continue to receive services from the cooperative.

This is not the best approach to governing a library resource sharing cooperative. While incorporating as a non-profit, non-stock, corporation has certain benefits, it appears that this level of incorporation does not allow clusters with public libraries to purchase data processing equipment for shared use outside of the municipality or to utilize debt financing (bonding for capital equipment). A quasi-governmental entity with the following characteristics may be a more appropriate governance structure for library resource sharing:

1. would have the ability to use debt financing to acquire, by purchase or lease, automated technologies: hardware, software, and firmware.

2. libraries of various kinds - public, academic, special, and schools - would be eligible for membership.

3. capital funds could be provided by municipal libraries for necessary equipment acquisition, replacement and/or upgrade. Further, equipment maintained, leased, and/or purchased for the legal entity would be for the exclusive use of libraries.

4. the entity would be entitled to receive equipment, services, and grants from state, federal, local, and private sources.

5. the entity would qualify, or be entitled to be qualified, as a tax-exempt entity.

6. the entity would have the power to contract for services as necessary and appropriate.

Quasi-governmental structures must be legislatively-established, and membership participation must be approved by the municipality. Although legislation was filed on behalf of the Board of Library Commissioners to enable the establishment of quasi-governmental organizations for library resource sharing, the Massachusetts library community was not enthusiastic about the legislative effort. The Board has since withdrawn the legislation. The problems with non-profit organizations, especially related to capital acquisitions, remains.

ENDNOTES

1. K. Leon Montgomery and C. Edwin Dowlin, "Governance of Library Networks," p. 181.
2. Huntington Carlile, "Diversity Among Legal Structures of Library Networks," p. 192.

3. Dick W. Hayes, "Governance of Library Networks," p. 154.
4. K. Leon Montgomery and C. Edwin Dowlin, "Governance of Library Networks," p. 181.
5. Huntington Carlile and John H. Burkley, "Legal Aspects of Organizing a Library Network," pp. 17-8.
6. Ibid., p. 18.
7. Ruth J. Patrick, Guidelines for Library Cooperation, pp. 92, 100.

To facilitate automated resource sharing in the Commonwealth, it is recommended that at least two legislative proposals be studied, drafted, and filed with the General Court. This section does not offer specific language but discusses those areas in which amended or additional legislation is desirable.

Reimbursement of Interlibrary Loan Net Lenders

Statistics have shown that interlibrary loan volume increases as access to informational resources through machine-readable bibliographic records increases. "Horror" stories about dramatic increases in interlibrary loan abound - some libraries claim an increase over a twelve month period of 400%. Others have added a record into a bibliographic utility on a Thursday and received an electronic interlibrary loan request for the item the following Monday.

Most libraries in Massachusetts want to participate in the resource sharing effort. However, in some cases, processing interlibrary loan requests creates personnel and administrative burdens on these libraries.

Clusters have the resources to resolve this problem if intra-cluster problem develops. Although funding to facilitate resource sharing is provided to the clusters by the Board of Library Commissioners, the issue of net lending within a cluster is an internal cluster policy matter. Clusters should be able to use the computer system to alleviate interlibrary loan burdens by equalizing the lending responsibilities among its members. Clusters may also consider approving credits on central site maintenance for net lenders. Regardless of how a cluster handles interlibrary loan within the cluster, interlibrary loan should remain free. If a cluster member cannot agree to this, that library should leave the cluster.

OCLC interlibrary loan subsystem participants have an obligation to lend materials requested through the bibliographic utility's interlibrary loan subsystem. Credits are issued to the library by the utility for each item loaned through the system.

However, many libraries are dissatisfied with both cluster efforts to diffuse the lending burden and with the amount of the credit provided by OCLC for lending an item. Some have stated that they will simply not lend - others do so reluctantly.

Massachusetts residents need access to the informational resources of all of our libraries. It is important that as many libraries as possible agree to lend requested materials. However, the imposition of fees by a lending library to recover the costs of the interlibrary loan process will probably become a barrier to resource sharing. Further, public libraries are prohibited from charging fees for interlibrary loan under their individual membership agreements with the regional public library systems.

Therefore, legislation which will provide partial reimbursement to interlibrary loan net lenders excluding intra-cluster interlibrary loan should be drafted and filed. Such legislation should be regulated by the Board of Library Commissioners - for example, what constitutes an interlibrary loan, how and what statistics are to be kept, establishing a minimum interlibrary loan activity level and determining the ratio of the

number of items loaned to the number of items borrowed in order to qualify for partial reimbursement, etc. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners.

Amending Cable (Community Antenna Television Systems) Legislation

Cable television (CATV) technology has immense potential as a data communications medium. CATV transmission bandwidth is capable of supporting sophisticated high-speed communications between library access points, such as between a main library and its branches, and can often "bypass" the need to use the network and systems of the telephone companies. In addition, such a communications mechanism is well suited for data communications between a member library and a cluster's central site computer system.

CATV is legislatively established in Chapter 166A of the Massachusetts General Laws. Section 1 of the Chapter defines the CATV "area or areas to be served" as the municipality or a portion of a municipality. Although it does not specifically forbid, the Chapter is not permissive when it comes to inter-municipal linkings of CATV systems. Therefore, only those libraries within a municipality in which a cluster's central site computer system is situated could utilize a CATV system for data communications between the library and the computer. Libraries in municipalities remote from the central site computer system cannot utilize the CATV system for data communications even if the municipalities are contiguous and share the same cable vendor. Telephone or some other communications mechanism must be utilized where it is not possible to take advantage of CATV capabilities.

Legislation which would permit inter-municipal linkages of CATV systems for the purpose of data communications should be drafted and filed. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners. Despite passage of the legislative amendment, libraries may find that cable vendors are not interested in offering inter-municipal CATV communications. However, cable vendors may find data communications a lucrative business supplemental to their entertainment interests.

Non-Resident Use of Public Libraries

The non-resident use of public libraries is an issue in those libraries which have a high ratio of circulation of materials to non-residents in relation to the library's total circulation. As differentiated from interlibrary loan whereby the item requested is sent from one library to another, non-resident use occurs when the patron travels to a public library located in a community other than the one in which he/she resides to directly borrow material. Circulation of material to non-residents has dramatically increased as automated resource sharing efforts have expanded. In 1987 legislation was passed which enables partial compensation to public libraries with a high ratio of non-resident circulation. Funding for the program was not, however, included in the Act. The Board of Library Commissioners will pursue the effort establishing a state budget account for this program.

15. RETROSPECTIVE AND CURRENT BIBLIOGRAPHIC CONVERSION

Increasing the opportunity to access the state's information resource relies upon locating a wanted item by determining which libraries own the item. Automating holdings information provides effective access. However, before an item is accessible utilizing automated technologies, the bibliographic information must be converted into machine (computer)-readable form.[1]

Retrospective Conversion

A retrospective conversion is defined here as the conversion of most, if not all, bibliographic records of the library's holdings (inventory) into machine-readable form. It may also include the necessary preparation of the individual item for use on a circulation/ILL control system, such as barcoding a book, if that is a short-term or long-term objective of the conversion process.

There are several methodologies, with many options within each alternative, of conducting a retrospective conversion of a library's collection:

1. online shared cataloging database
   Usually conducted through a bibliographic utility such as OCLC or Utlas, a terminal connected to the utility is used at the library to search online the utility's comprehensive database. The database catalog contains records from the Library of Congress database and original cataloging records contributed from other members. A large utility's database may minimize the amount of original cataloging the library must convert into machine-readable form. This methodology has many advantages including access to a comprehensive database and conversion of holdings into a full MARC record. Its disadvantages are that the library must supply the skilled labor to convert holdings into full MARC and to be able take advantage of the local editing capability a utility can offer.

2. batched shared cataloging database
   Using this methodology, the library uses a microcomputer to create a "short record" database on a floppy disk. The database includes several searching points such as the Library of Congress catalog number, ISBN, author's name, title, etc. The disk is then sent to a utility or a database vendor which can then run the short records against the larger comprehensive database for matching. The advantage to this alternative is that it is easier and cheaper for the library to convert data into short records offline than to convert online into the full MARC record. However, a disadvantage is that each match may produce multiple records which the library must then review from a computer print-out to select the desired record.

3. online local cataloging database
   This alternative has become more economically and technically feasible with the availability of microcomputers and optical disc technology. Vendors like The Library Corporation (BiblioFile) and Library Systems & Services (MiniMARC) market products which store the MARC file on optical discs (such as the compact disc read only memory more commonly referred to as CD ROM) and then use a

microcomputer and an optical disc drive to search the file for the desired MARC record. Files that were once accessible only through large computer systems can now be accessed through a desktop microcomputer. The advantage to this alternative is the cost of conversion is relatively low, especially when the volume of conversion is high. The disadvantages are that many of these systems include only the LC MARC database from which to draw matching records and do not include original cataloging contributed from other libraries which dramatically increases the comprehensiveness of a database and require skilled staff.

4. Importing a database
This alternative may be used when a cluster is installing a circulation/ILL control system and few member machine-readable records exist. Participants may want to obtain a copy of another cluster's database, load it onto the central site system, and use it for conversion purposes. The advantage is that the cluster will have a database available online to which they can easily attach item information which may speed the development of the new cluster's database. The disadvantage is that the number of matching records may be quite low if the database used is not similar to the database being created.

5. contractual retrospective conversion services
Several vendors offer libraries the option of sending them a copy of their shelflist for conversion by the vendor's staff. The advantages are that library staff time is not consumed by the conversion process, and the conversion can usually be done faster by the vendor than by the library. Also, the vendor can usually convert those records which are not found in the databases used in the matching process. Using this option requires that the library carefully plan what it needs as output from the vendor in terms of record format and content. Libraries will want to ensure that the vendor has access to a comprehensive database of bibliographic records, not just the LC MARC database.

6. keying the records locally without using a database
This option is not recommended for a comprehensive local conversion as the library creates its database by keying in the data without the benefit of using an already existing bibliographic database against which to match its holdings. It is never efficient to re-create machine-readable records which exist elsewhere. This option should only be used to create original records not available in a vendor or utility's databases.

Most of these conversion strategies should be capable of storing an offline archival copy of the bibliographic machine-readable database of the library's holdings. If and when the library implements an automated circulation/ILL control system, the machine-readable records created during the retrospective conversion process can by loaded onto the circulation system with very little effort.

No single conversion methodology may provide an entire retrospective conversion. Many of the options discussed above can be used together in an effort to conduct the conversion as easily, inexpensively, and completely as possible in order to get a full MARC record database. Considerations of methodology chosen should include:

- availability and quality of archival records;
- availability and quality of imported databases;
- quality and format of records provided by vendors;
- time allowed for the conversion;
- availability of human resources;
- capability to include local holdings information at the time of matching (otherwise the matched record will require subsequent editing before it can be used on a circulation system); and
- cost analysis of the various alternatives considering the issues above.

In the past few years, there has been a shift of emphasis in retrospective conversion toward including more comprehensive levels of description, even when the full range of data may not be immediately relevant. The reason is that, even when there is a clear idea of the immediate purpose for a retrospective project, there may be future, presently unanticipated uses that will require additional types of data. To exclude some bibliographic detail in a conversion now may be inviting problems later. Many of the Massachusetts clusters which input less than full MARC format records into their databases now must go through a second conversion to upgrade their databases to full MARC record format in order to take advantage of the many functions offered through online public access catalogs. With full MARC format and content bibliographic records from the start, the library may still want to extract only certain elements to use in specific applications, but the availability of the full record may save considerable effort and expense in additional future applications.[2]

The full MARC format is becoming the de facto standard for communication between physically separate bibliographic databases. Most of the projects linking bibliographic utilities, and projects linking disparate circulation control systems, will use MARC as the communication format for the data being sent and/or received.

Therefore, any cooperating group of libraries receiving funds administered through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should have a full U.S. MARC record format bibliographic database. Library clusters which have, or plan to have, less than the full U.S. MARC record format as their database will not be considered for funding.

Databases created on automated circulation systems provide a valuable tool for retrospective conversion of library collections. Therefore, to assist retrospective data conversion for libraries in Massachusetts, cooperating library groups receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with the central site system or equipment upgrade should allow, for a period of time and under conditions as specified on the contractual agreement between the cluster and the Board of Library Commissioners, network participants to copy the database at their cost for use in their own conversion projects. However, such an effort should be considered within the issue of copyright protections claimed at the time by OCLC. No cluster will be required to provide all or part of its database for copying by another network participant if OCLC claims it would infringe upon their copyright, whether or not the copying and transfer of the database would, in actuality, violate copyright.

Retrospective conversion projects are costly, and should be preceded

by a thorough collection assessment (and possibly weeding). Because of the general local nature of retrospective conversion projects, and their scope, no state or federal funds administered through the Board of Library Commissioners are available for local retrospective conversion.

Retrospective conversion of special collections considered unique in content will be considered for State funding (as available) for cluster participants. Library cooperatives which include public libraries as full members will be considered for State funding, as available and appropriate, if the converted machine-readable records would be made accessible through a bibliographic utility and/or cluster system Such funding will not amount to 100% of project costs as the project will require evidence of a local effort to convert the collection. Additionally, the general collections of the libraries involved should have been converted into full U.S. MARC format prior to requests for state funds to convert the special collections.

Serials are important in meeting the needs of library users. Over the past years, many libraries in the Commonwealth have formed cooperatives to develop union lists of serials. Union lists of serials become more useful when holdings are converted into machine-readable form because of their accessibility online, and because of the numerous offline products available such as printed union lists and microforms. Access to serials is further increased when contributors to an automated union list of serials can search the online holdings of other automated union lists. In addition, participants in OCLC/NELINET's Group Access Capabilities (GAC) program may also access NELINET's New England Union List of Serials (NEULS) project. Because of the importance of serials in meeting user needs, library cooperatives converting their union list of serials into machine readable form on NELINET's New England Union Lists of Serials (NEULS) project will be considered for state and federal funds (as available). Other retrospective conversion projects involving serials will be considered if the converted bibliographic records are also loaded into a NEULS database.

Creation of Machine-Readable Records for Current Acquisitions

All libraries participating in clusters, as well as most other libraries, need a source of machine-readable records from which to create records of the items they acquire on an annual basis. It is far more efficient to access and utilize an existing database of machine-readable records than to create original local records for each item received. Secondly, it is effective for resource sharing purposes if, during the process of creating a local record, the information is stored in such a manner that other libraries can access the bibliographic record to find which libraries own the item.

Library holdings may be converted into machine-readable form through bibliographic utilities such as OCLC or Utlas. Utilities provide records in standardized and recognized formats including MARC, AACR2, and LC, National Library of Medicine, government document and other subject headings. In addition, holdings information attached database records increases the opportunity to access the item by other libraries for resource sharing purposes. Member-contributed original cataloging increases the size of the database and the likelihood that a machine-readable record will exist for the item being converted. Further, with the appropriate linkages between the bibliographic utility and many automated

circulation/ILL control systems, the machine-readable record need only be created once at the utility, and then either downloaded online in realtime through an interface, or tape dumped into the system in offline batches.

There are several products available in the market place which assist libraries in creating machine-readable records and many of these products also have a linkage to automated circulation/ILL control systems. An example of these products is BiblioFile, a CD ROM based local cataloging system. Libraries use a microcomputer to access the Library of Congress MARC records on the CD ROM disk, attaching local item information when the matching record is found. In most instances, use of a local cataloging database as a source of machine-readable records is less expensive than using a bibliographic utility. Savings are realized in telecommunications, and the passed-through overhead and other administrative costs of the bibliographic utility and/or bibliographic service center.

While these products may be a less expensive per record source of machine-readable records than online utilities, the local holdings information created during the conversion process is not accessible by other libraries for interlibrary loan purposes unless it is loaded onto a circulation/ILL control system. Therefore, unless a library has access to a cluster's circulation/ILL control system, there is no online procedure by which to access that library's database for resource sharing. Furthermore, many of databases are limited to only those items cataloged by the Library of Congress without the benefit of member-contributed original cataloging.

No library, no matter how well funded or managed, can meet all of the informational needs of its patrons and the same holds true for clusters. A cluster may meet 90% of the needs of the users of its member libraries. However, each cluster needs access to other library databases to meet the balance of those requests. Further, a CD ROM-based conversion product may meet many of the cluster members' needs for machine-readable records, but it cannot meet all of the need. Many print and non-print items are not cataloged by the Library of Congress. Without access to another source of machine-readable records in addition to the CD ROM product, libraries will have to convert some items with original cataloging although the record may have been converted by another library and be available through a bibliographic utility. Therefore, clusters should have access to a bibliographic utility as a primary or secondary source for machine-readable records.

Creating machine-readable bibliographic records through a bibliographic utility also creates holdings information accessible by members of the utility for interlibrary loan purposes. Therefore, the utility's database can be a rich source of interlibrary loan for cluster members and other libraries. However, it should be emphasized that libraries may choose whichever interlibrary loan procedure(s) meet their needs in providing materials for their users. Libraries are encouraged to search databases in Massachusetts and/or request resources from other libraries in the state before seeking materials elsewhere.

Many library sources identify four bibliographic utilities - OCLC, Utlas, WLN (Western Library Network) and RLIN (Research Libraries Information Network). Most Massachusetts libraries are limited in their choice of bibliographic utilities to OCLC (through NELINET, a bibliographic service center) and Utlas, Inc. Both of these utilities have strengths and weaknesses. Following are the primary advantages of each to Massachusetts libraries:

OCLC Advantages

1. The number of Massachusetts libraries participating in NELINET, including all public academic libraries, the Trial Court libraries and many non-cluster, particularly special, libraries.
2. The position of OCLC as the de facto "national database" for libraries in the United States.

Utlas Advantages

1. Several clusters in Massachusetts have contracted with Utlas for completed retrospective conversion, increasing access to Massachusetts holdings through the utility's database.
2. Online authority control.

There are also disadvantages to each utility. The two primary disadvantages of OCLC are their price and copyright policy. For many libraries, particularly small libraries of all types, OCLC services are too expensive to obtain and continue. OCLC requires that a library convert all of its current acquisitions into machine-readable form on the system. This conversion cost is beyond many libraries' means. Further, the costs associated with accessing a record for cataloging or interlibrary loan may be too high for libraries, especially if the library has access to other sources of cataloging records. In addition, OCLC has "copyrighted" the database and claims it owns member contributed records. The utility has placed restrictions on their use by the contributing library, any other library and many library services vendors. The copyright issue is considered as a serious impediment to resource sharing by some members of the library community, and has yet to be satisfactorily resolved.

UTLAS, too, has disadvantages. Although it claims no copyright on any bibliographic records in the system, most of the contributors are non-U.S. libraries which may adversely impact the database's usefulness as a source for cataloging and interlibrary loan. In addition, the Library Services and Construction Act requires that the Long Range Program include "an analysis of the State's needs for development and maintenance of links with State and national resource sharing systems" (P.L. 98-480, sec. 304(c)(8)). It is doubtful that Canadian-based UTLAS can be recognized as a national resource sharing system for the United States.

Either OCLC or Utlas is recommended as a bibliographic utility. Both utilities could be used simultaneously because of the strengths of their various advantages. The advantage of access to a comprehensive database(s) for cataloging and interlibrary loan cannot be stated too strongly.

Libraries should evaluate their own needs when selecting a bibliographic utility. Libraries which select OCLC are encouraged to take advantage of an agreement between NELINET and Utlas which allows OCLC archival tapes to be sent to Utlas for batch mode authority control. Libraries which select Utlas are encouraged to arrange with Utlas and NELINET for periodic dumping of their bibliographic database with OCLC to further expand the resources in the national database.

Bibliographic utilities provide several alternatives which allow cluster members to access machine-readable records. One alternative is for all cluster members to be full, contributing members of the utility with an interface between the utility and the cluster's automated system for the online downloading of bibliographic records into the cluster's database. Both NELINET and Utlas offer "cluster memberships" whereby only one library

in a circulation/ILL control system cluster needs to be a contributing member of the utility. The library does all of its cataloging through the utility. Any record it finds for converting a local item can be downloaded online through an interface into the cluster database. The record is then available to other cluster members for attachment of their local item information without further charge by the utility. If a non-utility cluster member needs to convert an item not found in the cluster's database, it may request the utility member to search the utility's database for a matching bibliographic record. If the bibliographic record is found, the utility library attaches a "cluster identification number" to the item in the utility's database and downloads the record into the circulation system for the non-utility library to attach its local information. The record in the utility's database with the cluster identification number is then also accessible by any utility member for interlibrary loan purposes, the request going to the utility library in the cluster for referral to the library actually owning the item.

The cluster utility membership alternative has many advantages. First, the utility member library can access the database to locate matching bibliographic records which it can download into the cluster's database. There, the record can be used by other cluster participants without further charge. Secondly, the non-utility cluster library has indirect access to the millions of bibliographic records in the utility database for use in converting local holdings. Third, the holdings information of the cluster members downloaded by the utility member either for their local use or on behalf of a cluster library becomes available to libraries outside of the cluster, facilitating resource sharing. Fourth, this alternative can co-exist with a cluster whose members, except for the OCLC member, are utilizing a CD ROM product for conversion.

To further enhance the effort of contributing to the national database, clusters using this alternative are encouraged to periodically tapedump their database of all MARC format holdings into OCLC. Clusters choosing this option may apply for funds (as available) administered through the Board of Library Commissioners for the first tapedump of the cluster's database into OCLC.

In addition, this alternative can be used with NELINET's Group Access Capabilities (GAC) for interlibrary loan by cluster libraries of resources outside of the cluster's database. A GAC is a defined group of OCLC and affiliated libraries based upon some criteria - for example, a geographic region such as an entire State. NELINET and OCLC will allow any member of the cluster with a microcomputer to access online in realtime the OCLC database. The specific bibliographic record found will display the holdings symbol of the libraries in the GAC owning the item. The library can then request the item using OCLC's interlibrary loan subsystem. If the item desired is not owned by a GAC member library, the non-OCLC cluster library may request the OCLC member to search the OCLC database for the holdings of all libraries owning the item, and submit an interlibrary loan request on behalf of the library. The more participating libraries in the GAC, the more likely the desired item will be found without having to request the OCLC library to continue the search. This alternative provides an "intersection" point for resource sharing between members of a circulation/ILL control system cluster and Massachusetts libraries participating in OCLC but not involved as members of a shared circulation system. However, it should be emphasized that cluster members and other libraries may choose whichever ILL procedure and process is most appropriate to meet their needs, and are not required to access a

bibliographic utility to conduct interlibrary loan.

The alternative discussed above, and other alternatives, may be conducted through a designated centralized center in a cluster which accesses a bibliographic utility(ies) for conversion purposes, and may also, if the cluster and center are willing and a library so chooses, assist in locating interlibrary loan information through the utility(ies). A library could serve as this "centralized cataloging/ILL center", or the cluster may wish to establish such a center with a separate staff as part of the cluster's centralized services, much in the same manner as some clusters operate their central site automated system. Clusters could also cooperatively establish centralized cataloging/ILL centers. A single centralized cataloging/ILL center could be established for a region, or for the entire state. In most instances, the contracting regional or subregional library of the regional public library system that is also a member of a cluster could serve as the cataloging/ILL center. Clusters are encouraged to consider the appropriateness of establishing a centralized cataloging/ILL center as part of the cluster's administrative and operational services. Requests from clusters for funds, as available, administered through the Board of Library Commissioners may be considered for capital costs related to establishing centralized cataloging/ILL centers. It is emphasized that the proposed center need not conduct interlibrary loan on behalf of cluster members to be considered for funding.

Cluster members are not the only libraries in need of a source of machine-readable records for cataloging and alternative sources in which to locate user-requested materials for interlibrary loan. Most, if not all libraries, should consider having access to a source of machine-readable cataloging records which also display holdings information for interlibrary loan purposes, such as a cluster or a bibliographic utility. Each time a library catalogs an item that does not become a record in an automated bibliographic database with the capability to display holdings information of member conversions, and an interlibrary loan function, other libraries lose access to a resource that may be requested to meet the needs of a library user.

Again, individual libraries may use a CD ROM cataloging product for conversion. Many of the library's cataloging needs may be met by this tool. However, the same problems exist as they do for the cluster member - the product has a limited database and it cannot easily support access to the holdings of other libraries for resource sharing purposes. Another problem in the individual setting is that the cost of the product is borne solely by the library. The cost sharing found in the cluster situation is lost unless the library shares the conversion tool with other neighboring libraries.

NELINET, with the cooperation of the members of the circulation/ILL control system cluster, will offer the non-OCLC individual library the same alternatives it has for the cluster member. For cataloging, the individual library can access the cluster database for bibliographic records for conversion. If the needed record is not available, the library may request the OCLC member to search the OCLC database for a matching record and download it into the cluster. In addition, an individual library can become a Group Access Capabilities member, using identical interlibrary procedures offered to the non-OCLC cluster member. For both functions, it is recommended that the individual library have an appropriate microcomputer software.

Therefore, with this NELINET alternative, the library will have a source for cataloging records and at the same time will be contributing records to a cluster's database thereby increasing access to the informational resources of the Commonwealth, have an indirect means to acquire machine-readable records it needs for conversion through the OCLC member, and have access to two databases (the cluster's and OCLC) for interlibrary loan purposes.

Utlas offers non-cluster members direct access to cataloging services. It is possible for non-cluster libraries tc access cluster databases on Utlas which are maintained as individual files. Bibliographic records contributed in this manner can be periodically tape dumped into OCLC to enhance the resources of the national database.

Because of the importance of including as many libraries as possible in the resource sharing effort, clusters which have received funding administered through the Board of Library Commissioners should accept, if technologically and economically feasible, access by individual libraries approved by the Board of Library Commissioners. The libraries should use a microcomputer on a dial-up basis to access their database, and may contribute bibliographic item information to expand the cluster's database holdings. Further, these microcomputer dial-up libraries should be considered in the cluster's efforts to use a bibliographic utility for cataloging records and, if the cluster and its members so choose, interlibrary loan. For its part, the Board of Library Commissioners should provide the necessary funds (as available) to the clusters for central site equipment to accommodate the dial-up libraries. Also, the Board of Library Commissioners should provide funds (as available) for individual libraries to acquire the necessary start-up microcomputer hardware and software to access the cluster for ongoing bibliographic conversion of current items and interlibrary loan functions. Individual libraries should agree to abide by the rules set forth by the cluster, convert their current acquisitions into machine-readable form either through the cluster or a bibliographic utility, loan as well as borrow materials, assume telecommunications and other local operating costs as necessary, and pay the cluster as reasonably assessed for access and other operational fees for services provided.

Although Massachusetts is an information rich state, no library should consider its resources so common that another library would not need access to them. Therefore, all libraries in the Commonwealth are strongly encouraged to consider participating in a bibliographic utility or a centralized cataloging/ILL center. An alternative for some non-cluster libraries may be the utilization of a cluster's database for conversion of acquisitions, and the attachment of holdings information to the bibliographic record for interlibrary loan purposes. Although the availability status will always be "on shelf" for these records, the holdings information searchable by members of the cluster and by other contributing libraries will increase the number of access points into the informational resources of our State's libraries and facilitate intra-cluster interlibrary loan.

State and federal funds administered through the Board of Library Commissioners cannot be allocated for the local conversion of acquisitions. The creation of the bibliographic record is a local ongoing operating expense. However, funds could be allocated as available and appropriate for portions of the capital costs related to making a bibliographic utility

and/or a cluster's circulation/ILL control system's database more accessible for libraries to utilize for conversion and interlibrary loan purposes.

ENDNOTES

1. There are dozens of articles and books which discuss retrospective and ongoing conversion of records. Issues and alternatives for this section are from four sources: Susan Baerg Epstein, "Converting Bibliographic Records for Automation: Some Options," Library Journal (March, 1983) pp. 474-6; Rob McGee, Discussion Paper on Data Conversion for Library Automation, rev. ed., Chicago: RMG Consultants, Inc., 1982; Dennis Reynolds, Library Automation, p. 290; and Jon Drabenstott, editor, "Retrospective Conversion: Issues and Perspectives," pp. 105-20.
2. Dennis Reynolds, Library Automation, p. 284.

16. TELECOMMUNICATIONS

Automated resource sharing in Massachusetts is based upon telecommunications linkages between libraries and computer systems, between computers systems, and in many cases, between libraries. It is not an exaggeration to state that automated resource sharing is almost totally dependent upon these telecommunication linkages because of the decentralization of the various network components.

Libraries may utilize telecommunication linkages to access a bibliographic utility, a circulation/ILL control system cluster, a standalone circulation (or online catalog) system, reference/source database services, and/or library vendors providing acquisitions, serials control/ordering, or other services. In addition, linkages between computer systems are not uncommon. An interface to download bibliographic records between a bibliographic utility and a circulation control system, and the capability of a bibliographic utility to provide online access to a reference/source database service provider, are examples of computer-to-computer linkages based upon telecommunications technology. Linkages between libraries are becoming more common, especially involving intra-cluster telecommunications. In many of the clusters direct telecommunications lines between the library and the central site have been superseded by alternative configurations in which a library has one telecommunication line installed running from its library to another cluster library. The telecommunications line from the first library is then combined with the telecommunications lines of the second library and sent (through multiplexers) to the central site. Such "shared" telecommunication networks can save telecommunications costs, and may be configured to increase the time the system is operational ("up time") by improving reliability.

Telecommunication linkages between access points are necessary for resource sharing because developing a statewide, monolithic database of bibliographic records, while technologically feasible, is less effective when information concerning availability status is necessary to decrease interlibrary loan turnaround time. All of the machine-readable bibliographic records could be stored on a centralized database and accessed via telecommunications by libraries throughout the state. The costs to acquire and maintain the necessary computer system would be considerable. A l cumbersome alternative would load all of the machine-readable records available onto optical discs (such as CD ROM) for distribution to libraries owning the appropriate equipment and willing to purchase the discs. This alternative has the advantage of removing the dependency upon telecommunications for access.

However, in both alternatives, the bibliographic records accessed would include holdings information only. Libraries using these alternatives would have to contact the owning library through an interlibrary loan request, an electronic message, or by telephone, to determine if the desired item is available for loan. One of the advantages of accessing a bibliographic database stored on an automated circulation/ILL control system includes the ability to ascertain availability status of the item as well as ownership information. Further, the members of a cluster obtain at least 80% of their interlibrary loans needs from other cluster members and would need access to a statewide database only 20% of the time. Inter-cluster linkages would be likely to reduce further the need for a statewide database if it were possible to ascertain availability information from the link. A statewide database

disbursed to libraries on optical disc is adequate for holdings information only, while decentralized intra- and inter-cluster telecommunications linkages increases the effectiveness of resource sharing.

Several types of telecommunications links used are based upon analog lines. "Dedicated online" refers to a telecommunications link utilizing sole-purpose (dedicated for this use only) telephone lines and modems/multiplexers between access point hardware (a terminal or a microcomputer) and a computer which directly or indirectly provides a service. The link is always "on", that is, directly connected to and under the control of the central processing unit of a computer and the telecommunications hardware. Because the telephone line is dedicated and cannot be used for any other purpose and cannot contact any other location, the telephone company charges a monthly rate based on the number of lines and the distance between the access point (the library) and the computer. The telecommunications charge is applied whether the library actually utilizes the line or not.

The most common dedicated telecommunications lines in use in Massachusetts libraries are leased analog "3002" lines from New England Telephone. The "3002" lines are voice grade, the same that are used in homes as standard telephone service. The only difference between dedicated lines and the ones used in a home is that the regular house telephone can be used to call anywhere while the dedicated line has only one destination point. A "modem" (or multiplexer) is necessary at each end of the dedicated line to translate computer digital signals into and from the analog signals necessary for transmission using standard telephone lines. Without "conditioning", a technique which reduces interfering noise from the lines and applied by the telephone carrier at an additional monthly charge, these dedicated lines have a reliable top transmission speed of 9600 baud, which is 960 characters per second, and can also be used at slower speeds. Conditioned lines can transmit at faster speeds because of the noise reduction. Dedicated telecommunication lines are employed when the link is extensively used, such as intra-cluster between the member library and the central site, and, in many instances, between libraries and a bibliographic utility.

Another type of telecommunications link is commonly referred to as "dial-up" which does not depend upon a dedicated line. Using this type of link is almost identical to using a standard voice line except that computer and telecommunications hardware and software are necessary for the transmission, and the destination is a computer, not a human. When a dial-up transmission takes place, a terminal or microcomputer with the appropriate software is used to "dial" the phone number of the remote computer system being accessed. A modem connected to the terminal or microcomputer and to the standard telephone line converts the digital code used by the computer into the necessary analog signals required to communicate over the standard telephone line. A modem at the remote computer system re-converts the analog signals into digital code which the computer can understand. The terminal or microcomputer then communicates with the computer to accomplish its activity. Dial-up telecommunication links are generally used when the need for communication between two points is not extensive, and when the terminal or microcomputer is used for multi-functional purposes rather than having a sole purpose. Massachusetts libraries generally utilize dial-up telecommunication linkages to access bibliographic databases on cluster systems if they are not users of the circulation control module, to access reference/source databases, and to access library vendors offering services such as a source for machine-

readable bibliographic records, electronic mail, and electronic bulletin boards.

It is obvious that telecommunications is of critical importance to resource sharing efforts. Two issues usually arise when discussing telecommunications and its impact on resource sharing - costs and reliability.

Inefficiency in applying telecommunications technology and procedures hampers effective resource sharing and seriously affects costs. An example exists which illustrates this point. Many of the clusters' central site computer systems and telecommunication configurations will only allow a maximum of one terminal per computer port. That is, for every terminal existing in the cluster, it needs one port. This is inefficient, and costly. Most terminals are idle most of the time. Although they are on dedicated telecommunications lines, the terminals are not transmitting data, but waiting to do so. At the same time, the central site computer port is idle, waiting for communications from the terminal. Yet every time a terminal is added by a cluster member, a computer port is necessary even though, in computer processing terms, many of the existing terminals and ports are idle. Once the existing ports are assigned, the cluster must acquire another computer processor which could cost over $100,000 in order to acquire additional ports. Additional telecommunications lines and equipment may also be necessary, increasing the costs further. When these newly-acquired ports are assigned, another processor must be bought, and the cycle continues until the demand for ports is met, or the central site computer system configuration can no longer be expanded to accommodate any additional ports. In addition, response time, that is, the time in which it takes the central site computer to respond to a communication from a terminal, usually increases as more terminals and computer processors are added to the configuration. This problem is particularly worrisome as clusters begin to [illegible] online public access catalogs which will require a substant[illegible] of computer ports and processors which, in turn, will result in [illegible] degradation in response time. This cycle continues, negatively [illegible] resource sharing efforts.

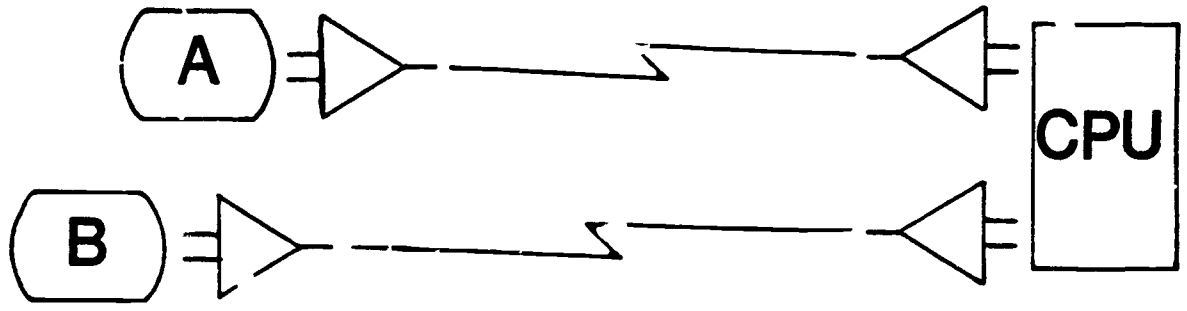
It would be far more efficient and less costly if the cluster computer and telecommunications systems could take advantage of "contentioning". In this process, telecommunications and computer technology make it possible for a computer port to accommodate more than one terminal. The terminals cannot communicate simultaneously through the same port, but would contend for the port when they need to communicate with the computer. However, since the port and the terminals are idle more than they are busy, contentioning usually does not result in long waiting queues. The advantage of contentioning is reduced costs. Because more than one terminal can share a single computer port, there is need for less ports, less telecommunications lines and equipment, and fewer computer processors to handle the terminals. If the computer system can handle contentioning, but the existing telecommunications system cannot, then contentioning cannot occur, and the one-terminal-per-port cycle will continue.

It is essential that clusters do not outgrow the ability to add additional computer ports which are necessary to support cluster activities, and it is also essential that the computer systems utilized by cluster members be capable of accommodating additional terminals without continually needing to add additional central site computer processors. Therefore, any cluster receiving funds administered through the Board of Library Commissioners which exceeds 50% of the costs to establish and/or

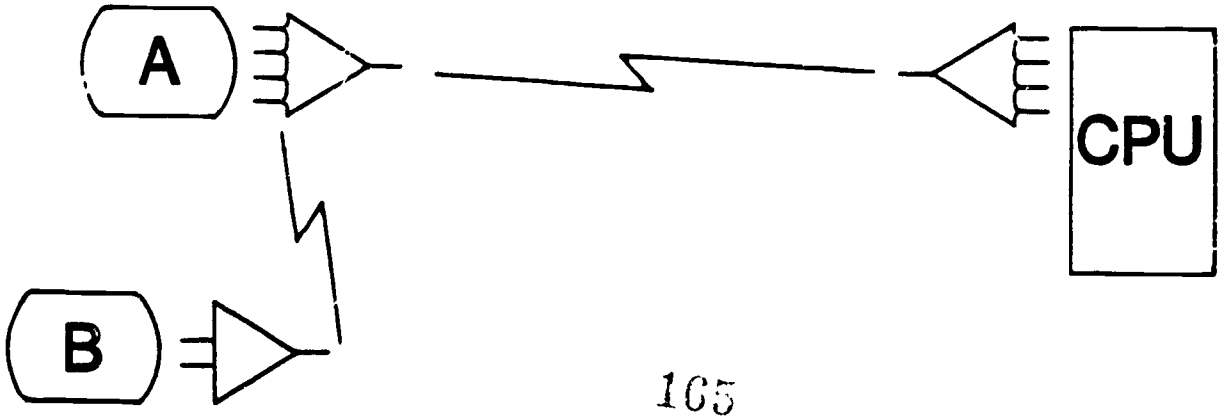
upgrade central site equipment should utilize a computer system that is capable of contentioning computer system ports. Any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment may only apply that funding toward a telecommunications configuration capable of contentioning with the cluster's central site computer system.

Intra-cluster telecommunications is costly, and telecommunications costs are expected to rise. Several of the telecommunication configurations used by the clusters do not take advantage of shared communication lines which affects costs, and which also affects reliability, another telecommunications issue. A couple of examples will again illustrate the point.

In several clusters, a library has installed one or more dedicated online telecommunication lines directly to the central site computer system. a "point to point" telecommunication configuration. In some instances, a direct line is cost effective and efficient. However, in many cases, it would be less expensive to design a telecommunications configuration in which, when appropriate, the library has a direct line installed to another cluster member which is enroute to the central site. Then, at the second library, the telecommunications lines for both libraries are combined and rather than two lines, only one telecommunications line comes into the central site from both libraries. The communication signals are then passed through a multiplexer which separates out the libraries' various terminal lines into their assigned processor's ports.



POINT TO POINT

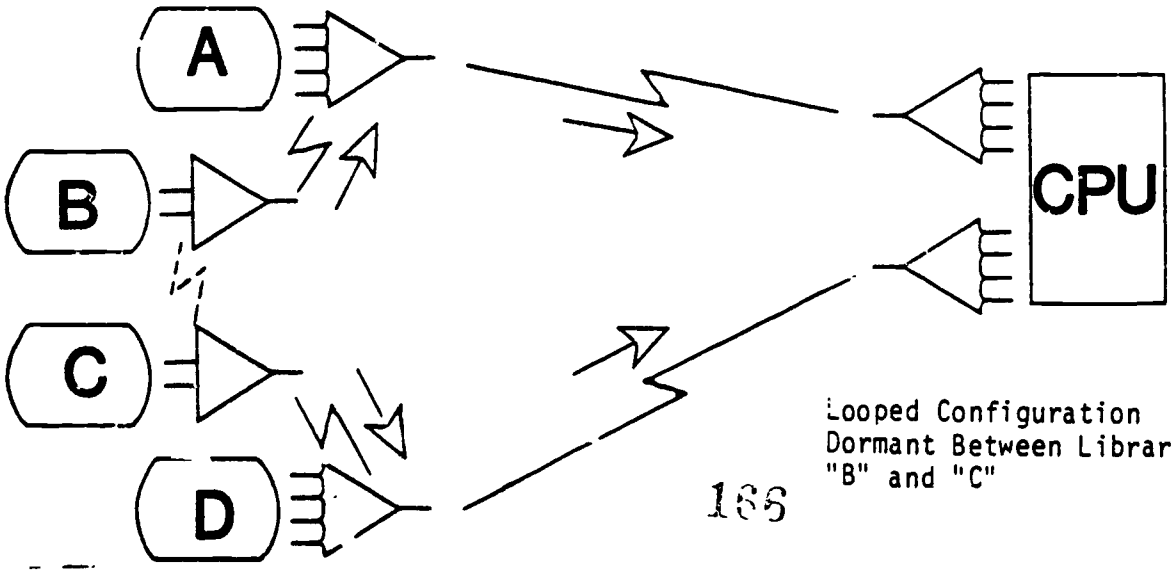


SHARED LINE

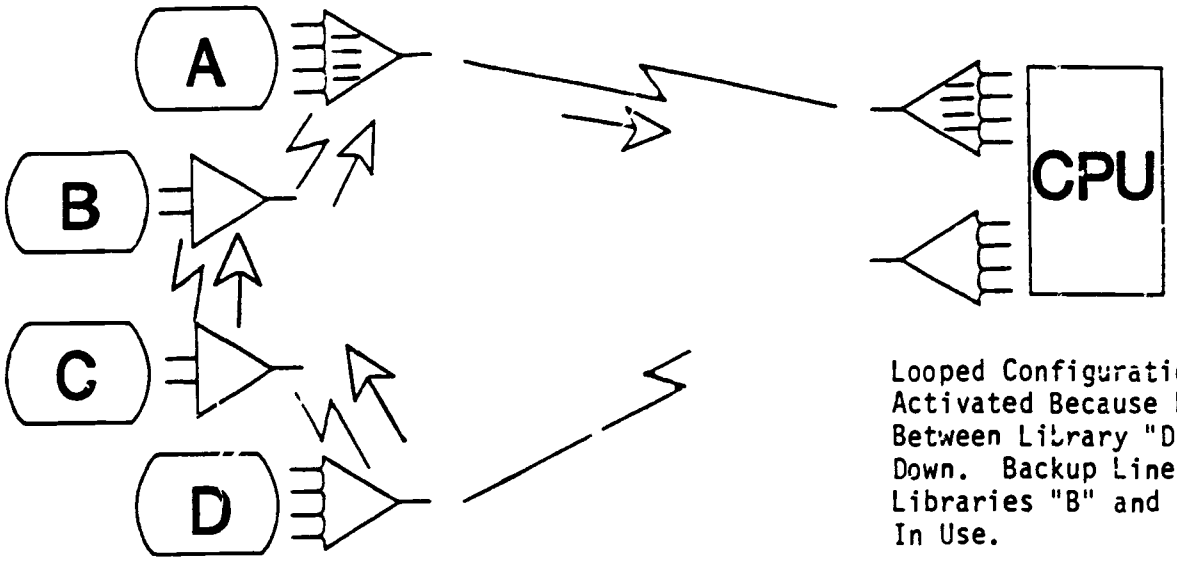
In this telecommunications configuration, the first library alone bears the cost of the telecommunications line to the other library. Then, the two libraries share the costs of the telecommunications line to the central site. The telecommunications costs for the first library have decreased (if the routing is properly configured) because it will be less expensive to have a direct line to the second library and from there share a telecommunication line than it would to have operated a direct line into the central site. The second library's telecommunications costs have also declined since another library is now sharing the necessary line costs to the central site.

Reliability can also be improved with a modification to this shared-lined configuration. In the point to point configuration where each library installs telecommunication lines directly into the central site, any time the telephone line does not function (goes down), the library has lost its umbilical cord (line) to the central site, and activities, for the most part, cease. Circulation terminals will not work, public access terminals will not work, and back-up procedures must be implemented. This can cause considerable problems if the line is down for any length of time, or if there are inadequate back-up procedures, such as the lack of a back-up for an online public access catalog.

A "looped" configuration may be implemented with the shared-line configuration. As before, one library installs a direct line to another library and, from there, the two libraries share a line into the central site. Two other libraries are configured in the same manner. Then, a telephone line is installed between the first and second set of libraries through the two libraries which have direct lines to the second libraries. The telecommunication line is not used unless one of the telecommunication links fail. Then, the dormant telecommunications line is activated and the affected libraries reverse direction on their telecommunication paths, passing through the activated link and "piggybacking" their telecommunications needs with those of the other libraries. When a link fails, all of the terminals in the affected libraries cannot be used without causing a telecommunications overload, but priority functions such as circulation and, maybe, public access can continue, sometimes (but not always - it depends on telecommunication loads) with a reduction in response time. However, the advantage of this configuration is that the reliability of online access to the central site increases and the potential for telecommunications downtime diminishes.



Looped Configuration
Dormant Between Libraries
"B" and "C"



Looped Configuration Activated Because Line Between Library "D" and CPU Down. Backup Line Between Libraries "B" and "C" Now In Use.

Therefore, to improve telecommunications costs and reliability, any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment should have in place a telecommunications configuration which utilizes as few lines as possible between and among cluster members and the central site, and should have a configuration which can bypass temporarily-failed (fours hours or more) telecommunication links so that a library still has no less than 20% of its terminals (libraries with four or less terminals must have at least one terminal) connected online in realtime to the central site.

As is evident, telecommunications using analog telephone lines is presently the backbone of decentralized automated resource sharing in Massachusetts. There has been discussion on how to reduce telecommunications costs and increase uptime and reliability. Is all of this necessary? Are there not alternatives to Ma Bell? Unfortunately, not in the short term. There are several technologies which "bypass" the telephone company - microwave, satellite, packet-switched telecommunications, radio packet technology, cable television, and fiber optics. Each has its own set of problems and issues.

Microwave is usually the most talked about bypass technology available. Towers and dishes are cropping up like weeds all over the state. But it may not be a viable bypass for libraries. Microwave transmissions require "line of sight" because microwaves travel in a straight line and cannot bounce off the atmosphere like radio waves, nor can they curve with the curvature of the earth. In order to use microwave, the origination and destination points must be "in sight" of one another. If the microwave is traveling farther than line of sight, it must be boosted at another tower before continuing on its way. Microwave signals cannot pass through hills or buildings but must go over them, which could

be an additional problem in an area likely to construct office buildings. It is estimated that at least 22 microwave towers are needed to move a signal from one end of the state to the other.

Besides line of sight problems, microwaves are susceptible to weather conditions. Rain and snow, not a rare occurrence in Massachusetts, may affect transmissions. Towers, equipment, and the right-of-way legal necessities make microwave very expensive and time consuming to install. The only viable manner in which libraries could take advantage of microwave as a bypass mechanism would be to contract for services from a microwave transmission service, either private or public (like the State). Another, not often discussed problem with microwave concerns the microwave dish itself. Few local historical commissions are going to be happy about microwave dishes on top of 19th century Richardsonian public library buildings.

More recently, satellites have been discussed as a bypass mechanism. Like microwave towers, satellite dishes are dotting the landscape, especially in rural areas where television reception is poor. Satellite transmissions do not have the line of sight and atmospheric constraints that microwave has. However, despite the satellite's power and ability to penetrate through almost any atmospheric condition their near-term is beyond most libraries' reach.

At this time, a geosynchronic satellite transmission's "footprint" covers one third of the globe, more area than needed by Massachusetts libraries. Each satellite typically has 24 transponders capable of sending and receiving thousands of transmissions simultaneously. Satellite launches cost about $75 million with launching dates already booked into the 1990s. Unfortunately, because there is a waiting list to launch transponders, unsold transponders are not available. Several cable television stations share transponders, one station broadcasting for twelve hours, and then the second station broadcasting for twelve hours. Libraries would need full-time access to channels on a transponder for communications. To send (uplink) and receive (downlink) satellite signals requires two dishes at each library, unless all communications to and from libraries are funneled into one or more earth station sites with the necessary uplink and downlink equipment. Then the problem of each library telecommunicating with the earth station arises.

In the 1990s, satellite communications will vastly improve when gigahertz transmissions replace existing megahertz signals. Then the footprint will shrink considerably, and more satellites can be launched with a greater transmission bandwidth which will decrease satellite transmissions' interference with one another and dramatically increase the channels possible on each transponder. Until then and when and more private companies purchase transponder capacity to re-sell to users, satellite bypass is not feasible.

Packet-switched technology using X.25 standards sometimes replace dedicated lines for telecommunications. In packet-switched telecommunications, hardware and software installed between the library and the computer system sends data in packets which selects different telecommunications routes as necessary, always looking for the fastest, most error-free and direct line, the most "logical" route. Dedicated lines usually send a constant stream of data, and the origination point (the library) and the destination point (the computer system) are considered "physically" connected since the data always flows over the same lines.

Users are only charged for the number of "packets" of data sent, whereas the telephone company charges for access to the dedicated line whether or not any data is sent.

Public and private data networks, such as Telenet, utilize packet-switched technology. One of its main advantages is that it is distance independent. Users pay the same for telecommunications to access a computer system whether they are 100 miles or 1,000 miles away because they are being charged for the volume of data sent and received through the lines. Another advantage is the sophisticated error detection available in the technology. If an arriving packet has been corrupted during transmission, the receiver will automatically request that the packet be re-sent. Because the communications follows logical paths, its reliability is increased over physical connections since it will automatically re-route around failed links.

Because of the cost of the necessary PAD (packet assembler disassembler) hardware, software, the need for the computer system and telecommunication systems to be capable of working with packet-switched technology, and the costs for the packets sent and received, packet-switched technology is usually not cost effective versus dedicated lines if the distance between the origination and destination points is less than 400 miles. However, the costs for packet-switched telecommunications have been declining. Considering its error detection capabilities, packet-switching may become more cost-effective for short-hauls within a few years.

Another type of packet network that is being implemented by some California libraries uses radio technology. Data to and from the computer system is sent on radio signals replacing all telecommunication lines. Line of sight is desirable, but not absolutely necessary. This technology may be promising depending upon the likelihood of eliminating interference from numerous local sources such as other radio signals and microwaves.

One of the most powerful telephone bypasses uses cable television (CATV) technology. Data is sent through CATV channels installed and maintained by the local cable company. Lexington uses CATV communications so that schools in the community can access the bibliographic database on the automated circulation control system at the Cary Library. As CATV channel bandwidths increase, and channel capacity continues to grow, CATV becomes a very viable telephone bypass.

However, there are several "political" problems with using CATV. First, Massachusetts General Laws prohibit cable systems from inter-municipality communications. Therefore, a library in one community cannot use CATV channels to telecommunicate with the central site computer system in another municipality even if the two communities are contiguous and have the same CATV vendor. Secondly, many CATV vendors are not eager to allocate a channel for data communications since "entertainment" is more profitable than data communications. Therefore, inter-municipal communications using CATV will require a legislative amendment, and many municipal CATV franchises are under no obligation, and in no hurry, to offer even intra-municipal data communications.

Another popular telephone bypass mechanism often discussed is fiber optics technology. Fiber offers several advantages - it is relatively noise free compared to the copper twisted cable used in 3002 lines, is digitally-based rather than analog eliminating the need for modems, and

thousands of communication channels can be implemented in the same physical space required for one 3002 channel. Fiber, for the most part, will improve telecommunications reliability, but will not necessarily become an important bypass mechanism. This is because the main installers of fiber optics are the telephone service providers themselves. To the communication providers, fiber offers increased reliability over existing lines, can dramatically increase the number of channels capacity in telephone ducts and lines that were becoming physically tight, and is much easier to maintain. Many public and private packet-switched networks are also installing fiber for the same reasons as the telephone companies. On the more local level, fiber is commonly used in local area networks (LAN) to improve communications within an institution, such as an academic campus. Fiber will not become a bypass mechanism for intra-cluster telecommunications except for those libraries which are part of an institutional local area network and which also host the cluster's central site computer system (which must also be on the LAN). As telephone companies replace cooper twisted cable with fiber, problems with telecommunication lines should decrease, positively affecting resource sharing telecommunications.

If bypassing the telephone company is not an immediate or viable short and/or long term solution to the telecommunication needs of resource sharing efforts, what can be done? First, libraries should improve the efficiency and effectiveness of their telecommunications configurations by employing as few telephone lines as possible, and by having backup telephone lines available to route around failed telecommunication links. Secondly, intra-municipal or intra-institutional telecommunications users should explore using CATV and/or local area networks based upon fiber optics cabling. Third, clusters with inter-LATA (between two area codes) telecommunications needs may reduce costs by replacing AT&T with another telecommunications vendor such as MCI or Sprint. Fourth, intra-LATA (within an area code) telecommunications is being deregulated which will allow telecommunications providers such as MCI and Sprint to compete with New England Telephone for business. A cluster may be able to reduce costs if all of its New England Telephone telecommunications lines are replaced with a competitor's. Fifth, it is essential that the Network Advisory Committee, clusters, and others affected by telecommunications actively examine private and public data and telecommunications service providers to ascertain what is available and beneficial. Sixth, it is equally important that clusters and others explore bypass technology to replace or supplement existing telecommunications as it becomes technologically and economically feasible. This includes the use of microwave, packet-switched and radio packet technologies, satellite, and others. Therefore, the Board of Library Commissioners will consider requests for funding, as available, to explore and/or experiment with viable telecommunications bypass mechanisms or alternatives to New England Telephone and AT&T which could be utilized for resource sharing purposes.

There is another possibility which could reduce a cluster's dependency on telecommunications. Currently, every time a cluster library uses a terminal for any circulation purpose such as to discharge or charge a book, it is necessary to telecommunicate with the cluster's central computer system. Some of this telecommunication activity could be reduced if several of the central site computer system's functions were distributed to the remote cluster library. With the availability of the 32 bit microcomputer, distributive remote processing is technologically feasible. A cluster library would have a local microcomputer with software duplicating several of the functions available from the central site

computer system, such as charge and discharge. When a book is charged or discharged, the terminal communicates with the microcomputer rather than the central site computer. Transactions are stored on the microcomputer for a specific time period and then telecommunicated in a batch to the central computer system in order to update the central files. Other functions could also be handled by the local microcomputer.

Distributive remote processing may reduce telecommunications costs and decrease (or at least maintain) the usage of the computer processor at the central site, alleviating the need for additional computer processors to handle increases in transaction loads. Each cluster should explore the possibility of implementing a distributive system involving the central site and remote cluster participant. To encourage development of remote distributive processing, the Board of Library Commissioners will consider requests for funding, as available, from clusters to establish pilot projects to experiment with remote distributive processing which could also be applied and utilized by other resource sharing clusters.

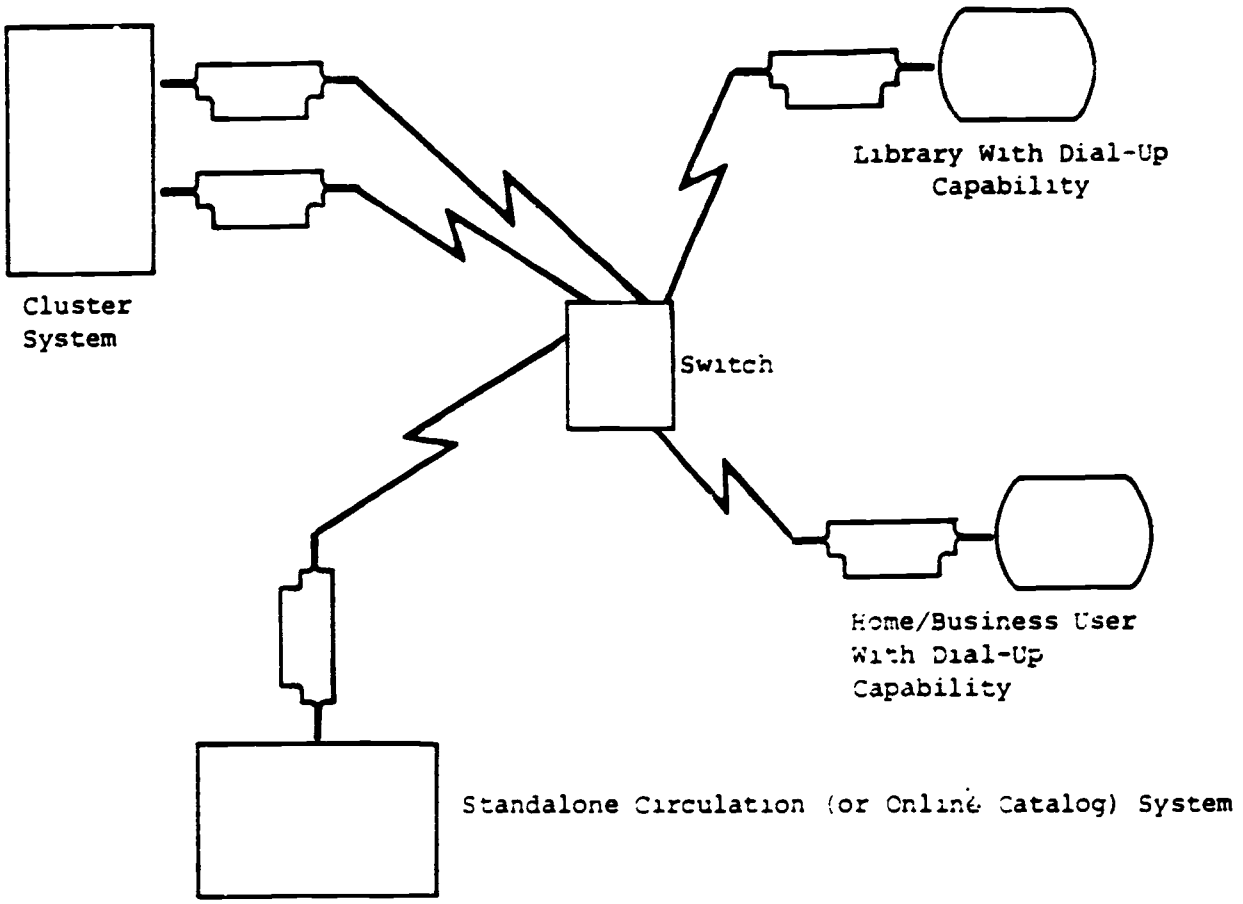
An effort has been made in the past to reduce annual telecommunications operating costs by approaching the Massachusetts Department of Public Utilities (DPU) to request that libraries participating in resource sharing cooperatives receive a discount on their related telecommunications costs. A similar request has been made on the national level to the Federal Communications Commission, without success. Officials with the Massachusetts Department of Public Utilities have stated that such a request is nearly impossible to approve. Many educational and other organizations also have a need to reduce telecommunications costs whether or not as a result of applying automated technologies. If one group was to receive a discount, requests from similar public groups, in all fairness, would probably also have to be approved. The requests would never cease. In addition, the program would be difficult to administer. What would be included for the library rate? Cluster telecommunications would be logical, but what about the telecommunications costs to access a bibliographic utility or a reference/source database service? How would one consider inter-library electronic mail? Also, as a result of the approved discounts, the costs of telephone services for consumers would necessarily increase to absorb the approved rate decreases. State regulated telecommunications rate decreases for automated library resource sharing do not appear to be a possibility.

It is important for network components, and specifically clusters, to begin to resolve their telecommunication problems. Soon, most cluster members will install terminals for their users to begin to access the cluster's bibliographic database to supplement, or replace, the card catalog. Online public access catalogs will test the resources of both the telecommunications and central site computer systems. In many instances, the online public access catalog will need to be supplemented by periodically-generated offline copies of the cluster databases on optical discs. In addition, it is inevitable that home, academic and business users will want electronic access to the cluster's database by using dial-up telecommunications with their microcomputers. The necessary central site computer ports and telecommunication hardware and software should be in place in order to expand access to the clusters' machine-readable records for users wanting to search library holdings remotely without having to visit a library.

Further, clusters may want to consider making their holdings database available for access by videotex service providers. If a videotex service

is introduced within the cluster's geographic area, the cluster may consider offering access (perhaps for a fee) as one of the databases available to the user. Telecommunications will play a major role in allowing a cluster to offer such access.

Eventually, inter-cluster telecommunications linkages, even between disparate computer systems will be possible and will expand the resource sharing effort. Coupled with libraries and remote users employing microcomputers to access the clusters via dial-up, and standalone circulation (or online catalog) systems, it may be efficient and effective to install a centralized telecommunication "switch" to route all of this traffic. Users and libraries with microcomputers could call a toll-free number to access a central ized computer which, when connected, would present a screen of choices of clusters to access. Once the user or librarian has indicated which cluster they wish to access, the switch would handle the telecommunications with the target cluster. Inter-cluster linkages could also be implemented in a similar manner.



Telecommunications is crucial to automated resource sharing efforts. It is a costly capital and annual operating expense. Therefore, the Board of Library Commissioners will consider requests for State competitive grant funds, as available when appropriated by the Legislature, from clusters for the capital purchase of telecommunications equipment which is shared by two or more libraries. No funds will be considered for equipment which may

only be used by a single library. In addition, the Board of Library Commissioners will allocate, as available when appropriated by the Legislature, State funds to help offset telecommunications costs in cluster-related resource sharing efforts. Funds will be allocated in priority order:

1. for toll-free lines into the clusters for dial-up access by libraries;
2. for two telephone lines (one for receiving and one for sending) for inter-cluster telecommunications; and
3. to offset the cluster's telecommunications costs accrued between remote participating libraries and the central site computer system, excluding intra-municipal and intra-institutional telecommunications costs.

ENDNOTES

1. Clifford A. Lynch and Edwin R. Brownrigg, "The Telecommunications Landscape: 1986," p. 41.

17. COLLECTION DEVELOPMENT AND MANAGEMENT

Resource sharing and automated technologies may be applied toward expanding and improving two of the library's primary functions - collection development and collection management. Resource sharing facilitates access to informational sources which may impact upon collection development in an individual library, or upon a cooperative group of libraries individually and collectively. Automated systems may be utilized to provide library managers with pertinent information concerning collection use and resource sharing activities.

Although the terms are frequently used interchangeably, for purposes of this document collection development is defined as:

> a term which encompasses a number of activities related to the development of the library collection, including the determination and coordination of selection policy, assessment of needs of users and potential users, collection use studies, collection evaluation, identification of collection needs, selection of materials, planning for resource sharing, collection maintenance, and weeding.[1]

Collection management is:

> a term used to refer specifically to the application of quantitative techniques (statistical analyses, cost-benefit studies, etc.) in collection development[2]

Collection managemert includes consideration of conservation and preservation activities and the role of automation in those activities.

As has been stated repeatedly, no library, no matter how well managed and funded, can be self sufficient because of the rate of increase in the availability of information, in its complexity, and its costs. Therefore, libraries find themselves seeking cooperative arrangements with other libraries to share resources. Although increased bibliographic and physical access to informational sources is a primary resource sharing activity, cooperative or coordinated collection development activities may evolve from or develop concurrently with interlibrary loan and reciprocal borrowing efforts.

Before entering into any arrangement for resource sharing involving cooperative collection development, a library should first conduct a collection assessment to ascertain what it has to share; second, it should determine by collection use studies exactly what it can afford to share; and third, it should examine its collection development policies concerning acquisitions, formulating a statement of what it should collect and what material it will depend upon a resource sharing partner to supply. Finally, it should decide with whom to share resources, bearing in mind what the technological requirements are and if they are possible in order to make a resource sharing effort work.[3] The benefits of cooperative or coordinated collection development arrangements among libraries provide for some or all of the following options:[4]

1. greater selectivity in some areas and the consequent ordering of fewer noncore titles because of more clearly articulated selection policies and added confidence that titles not purchased

will be available elsewhere through resource sharing
2. encouragement and support of more economic and cost-effective patterns of collection development; reduction or divestiture of responsibility to acquire and preserve in some areas
3. planned, rather than haphazard or crisis-driven, cost reduction
4. coordination of pruning, canceling, or storing of library materials
5. coordination of preservation activities to reduce unwanted redundancy or unintended duplication of effort among libraries
6. elimination of undesirable redundancy in collection development activities among cooperating libraries
7. expeditious and regular communication with cooperating libraries and among staff at both administrative and operational levels
8. better understanding and monitoring of collection development performance - both locally and cooperatively
9. the establishment of library of record status or primary collection responsibility for specifically defined subject areas, formats, etc., of regional [state] or national importance which few or no other libraries collect
10. identification of a group of libraries committed to collecting for specific subject, format, or linguistic areas on which other libraries could rely in a coordinated collection development and resource sharing environment
11. coordination of planning for staffing of acquisitions, cataloging, preservation, and interlibrary loan operations
12. distribution among smaller or closely neighboring libraries of certain core or basis areas in order to reduce unwanted, or unsupportable, redundancy.

The impact of resource sharing upon collection development in a specific situation will depend largely on whether the library treats the effort as an excuse to do less or a challenge to do more.[5] When the library belongs to a cooperative network, the requests for materials not in the library increases. Through analysis of these requests, the library can gain information on its ability to satisfy local needs locally, with implications for the collection development goals of the library which strives to provide immediate access to resources in addition to providing access to materials outside of the library. At the next level, analysis on a cooperative-wide basis of interlibrary loan fulfillment rates provides an essential measure of strengths and weaknesses in the cooperative of resources, and can lead to improvements in collection development through cooperative selection mechanisms, subject specialization and division of primary collecting responsibilities, designation of libraries of record, and setting goals strengthening shared resources beyond what could be possible on a smaller economic scale.[6] It should be emphasized to librarians and users that cooperative collection development does not relieve the library of its responsibility to purchase those materials which are most needed locally, and to rely on resource sharing partners only for other, less-demanded materials.

Increasingly sophisticated bibliographic retrieval systems available through computer technology permit distribution of resource sharing and collection development among an increasingly larger number of libraries, assisting the librarian to cope with problems stemming from rising costs and the inability to shelve all of the informational resources to meet the seemingly endless and diverse needs of the user.[7] The use of automated bibliographic utilities and shared circulation/ILL control systems dramatically improves bibliographic access to resources held outside of the

local library. Both systems can also be used by participants to cooperatively develop collections which would further enhance the resource sharing effort.

For example, cluster participants purchase several thousand titles annually. However, it is estimated that as much as 50 cents of the acquisition dollar purchases duplicate titles. Duplication is unavoidable and necessary for titles in demand. However, cluster members could improve the participants' total collection depth by approving collection development policies in agreed-upon subject areas. Such a project, preceded by a collection analysis aided with information generated by the cluster's computer system, and other tools such as the Research Libraries Group's Conspectus, could reduce duplication of little-circulated materials in all libraries while strengthening many subject areas and possibly enabling the cluster to consider purchases in subject areas unfunded at this time. An online acquisitions system integrated (or integratable) with the circulation control system could provide further assistance in this effort.

A cluster-wide collection development project using the information from the existing automated system illustrates that the application of management information systems to collection development and management has become more practical with the introduction of computer systems in libraries. Such management decision systems can supply data on usage, cost, age, subject, and publisher distributions, as well as other characteristics of the existing collection and new acquisitions.[8]

For example, many libraries utilize information from their computers to make better use of the collection. If a library has multiple copies of a book in various locations, it may be possible to transfer the publication to another library where it is in heavier demand. The online system also enables the administrator to monitor usage to order additional copies of titles in heavy demand. Further, the management information produced can also be used in budgeting, providing the librarian with specific trends and the confidence to assure funding authorities that unnecessary duplication will not occur.[9]

The automated system can generate information useful in collection maintenance. Many libraries may make better use of existing space by monitoring collection usage to identify books that have not circulated in years. Then the librarian can evaluate the item and make the decision of whether to discard or move it to another site for storage.[10] A cluster system with a "last copy" function can ensure that a library will not inadvertently discard the only copy of a title available in the cooperative's total collection. The cluster's "last copy" policy can then guide the librarian as to the appropriate disposition (hopefully storage) of the item.

Intra-cluster resource sharing and access to information sources can be improved if members approve and utilize cluster-wide collection development and management policies. All automated resource sharing clusters which have received funding administered through the Board of Library Commissioners in excess of 50% of the costs associated with the establishment and/or equipment upgrade of the central site computer system, should have membership-approved collection development and management policies, approved as to form by the Board's staff, in place by January 1, 1990. Because collection development and management policies should be proceeded by collection surveys, clusters may be considered for funding (as

available and not to exceed $100,000 per cluster) to conduct analyses of members' collections to identify strengths and weaknesses, and to assist in preparing the policies. Other library cooperatives may also be considered for funding (as available and not to exceed $100,000) to conduct a member collection survey.

Some librarians have stated that funding for collection development projects should be discrete and not allocated from existing materials budgets. A suggested source for this funding would be state and/or federal funds administered through the Board of Library Commissioners. It is a long standing policy of the Board of Library Commissioners that state and/or federal funds are not provided for general collection development because it is viewed as an annual operating expense. However, funds appropriated through the state competitive grant round have been awarded to libraries seeking to strengthen and develop specific aspects of their collections. Collection development and management policies, if properly planned and implemented, will reduce duplication of titles within a cluster providing increased access to an increased number of informational sources which will directly benefit the library user. Therefore, it will not be a hardship for members to re-allocate a small percentage of their materials budget to cluster-wide collection development projects.

Several other aspects of collection development and management will also be affected by automated technologies. Online access to reference/source (information retrieval) databases are forcing librarians to reconsider acquiring the print copy of indexes. On the other hand, the introduction of the optical digital disk, such as CD ROM, will result in the publication of files currently only available online, or in thousands of sheets of microfiche. For example, libraries can now acquire the ERIC database on CD ROM for use locally, and will need to consult the online database less often. Such an arrangement may have tremendous costs savings on telecommunications and online usage charges for a library which is a heavy user of a remote reference/source database. The result may be that libraries:

- eliminate the print copies of lesser-used indexes replacing them with online access;
- purchase the CD ROM or other disc format version of the heavier-demand indexes (if available and affordable);
- access the online database for the most current information to supplement the disc format, and to access databases available only online;
- save space because of the compactness and storage capacity of the CD ROM and/or because of the replacement of print indexes with online access.

All of these options will require that the librarian assess the needs and usage of all indexes and carefully evaluate all of the options available utilizing techniques such as cost-benefit analysis.

Another contribution of automation to collection development and management is the dramatic improvement of access to rare, unique or valuable resources. There are two major ways in which automation can improve access:

1. by preserving the material itself in an automated format. Currently such materials must be carefully preserved and/or access limited because of the fragile nature of the item or

because of its value. However, if the item's information and character (typology, illustrations, etc.) can be captured through optical disk technology, such as videodisc, the original can be preserved and appropriately stored, while the digital duplicates are widely made available for use.

2. by including ownership and status information in one or many databases. Ownership information serves to publicize the existence and location of these materials and will increase access to the items which the library has preserved in original, microform, or automated format. Status information for an item can indicate physical condition, limitations on use and preservation activity for that title, and can serve as a cooperative collection management tool to coordinate preservation efforts and avoid possible duplication of preservation activities in regard to individual titles.

Electronic publishing will undoubtedly affect collection development and management over the next few years. Publishers are exploring electronic means to disseminate their information and materials in a more timely manner on a "pay per use" basis. As envisioned by some publishers, material would be available only in electronic form which could be accessed at one fee level, and a copy of the desired information would be made available at another level of cost (presumably higher). This is appealing to publishers and writers who believe this closer control of dissemination of their work will increase fees and other royalty payments lost to photocopy machines.

Although unappealing at first, the consumer may find that this approach has several advantages. Libraries (and users) would pay for only that information wanted - therefore, they would not need to "subscribe" to an entire serial when only three or four articles are used. In addition, the library would have access to many more titles than it could afford through subscription. Coupled with commercial delivery of the wanted information, electronic publishing may expand the access the library has to the diverse informational resources available in a more timely fashion, paying only for the information desired, and probably saving physical space required to store seldom or never-used publications.

A frequently discussed storage and delivery mechanism for electronic publishing is videotex. Interactive in that the user can search a computer database seeking desired information or material, information via videotex can be delivered to any standard television set with an appropriate keyboard in geographic areas where the service is available.

Access and the availability of informational resources may be improved through electronic means and electronic publishing. However, electronic formats will not entirely replace printed materials. Both must, and will, co-exist and supplement each other for the foreseeable future as market forces may determine that much of the information produced will be stored and accessed electronically and then made available (for a price) in print or other formats, such as CD ROM. These technological developments will influence library collection development and management practices and policies.

Concepts and policies concerning collection management and development, and many related issues including preservation, are not fully developed in this document. An ad hoc committee on interlibrary

cooperation which was being established in late 1987 by the Director of the Board of Library Commissioners will further discuss collection development and management in order to suggest future policies and activities.

ENDNOTES

1. Heartsill Young, The ALA Glossary of Library and Information Science, p. 49.
2. Ibid., p. 50.
3. John R. Kaiser, "Resource Sharing in Collection Development," p. 144.
4. Paul H. Mosher and Marcin Pankake, "A Guide to Coordinated and Cooperative Collection Development," p. 421.
5. Arthur Curley and Dorothy Broderick, Building Library Collections, p. 173.
6. Ibid., pp. 173-4.
7. Paul H. Mosher and Marcin Pankake, "A Guide to Coordinated and Cooperative Collection Development," p. 418.
8. Barbara Magnuson, "Collection Management: New Technology, New Decisions," p. 736.
9. Donald Sager, "The Economics of Library Automation: The Agony and the Ecstacy," p. 4.
10. Barbara Magnuson, "Collection Management: New Technology, New Decisions," p 736; and Donald Sager, "The Economics of Library Automation: The Agony and the Ecstacy," p. 4.

Evaluation is the systematic appraisal of operations, products or services resulting in the measurement of utility, effectiveness, or the difference between expectation and practice.[1] There are various points in time when evaluation can or should be done - when planning, members should evaluate the potential benefits they expect to receive; after and during operations to seek improvements; and when expanding or modifying activities.[2]

Evaluation is an activity whereby:

1. According to goals or performance expectations, current operations can be assessed. The difference between performance criteria or specifications and evaluation is important. Performance criteria essentially relate to the way the network is supposed to function. Evaluation is the process of judging the worth or value of an activity. There are at least eight factors for performance criteria, to be viewed from two perspectives: 1) technical (network system) and 2) behavioral/social (human interaction by the user and librarian):[3]

   a. reliability - expressed as the probability of success
   b. flexibility - the ability to respond or conform to changing conditions
   c. accessibility - the capability to communicate with the resource sharing network by using a variety of different modes and media
   d. availability - the probability of gaining access to the network at the desired moment
   e. efficiency - the effective operation of a system as a function of its cost in terms of time, money, and energy
   f. effectiveness - the ability to achieve specified goals or ends, to perform or produce what was intended in the manner intended
   g. acceptability - the state of receiving or taking responsibility for a system as per written specifications and standards
   h. quality control - those methods and procedures instituted to ensure that the information put into and retrieved from the system is correct in terms of form and content

2. Feedback to the planning activity is provided before implementation.

3. Several feasible decision alternatives or designs are compared prior to selecting one alternative.

4. Feedback is provided between implementation stages.

5. An analysis can be conducted on how or why a decision or process succeeded or failed.

There are at least three general models employed in the evaluation process:

1. statistical techniques - utilize empirical data to compare or predict processes or attributes. Some of the techniques applied

include:

a. informal feedback from library personnel
b. informal feedback from users
c. analyses of cost and usage statistics
d. formal surveys of operations in libraries
e. operational search analyses - workflow and cost-effectiveness tradeoffs. The evaluation of the effectiveness of the network should include a cost-benefit analysis. Does the network increase access and improve operating efficiencies without transferring a burden of inconvenience or cost to the user?
f. formal surveys of users

2. mathematical/analytic models - suited to problems that fit an existing mathematical model or for which a model can be constructed

3. simulation - combines statistical techniques and mathematical models that build a model of the entire system or subsystem using statistical probability distributions for generating and controlling transactions, but also utilizes analytical techniques to compute the values of certain variables.[4]

Evaluating Massachusetts Resource Sharing Activities

There is little about evaluation of automated resource sharing in library science literature.[5] In fact, several critics take joy in pointing out the lack of evaluation as evidence of the failure of automated resource sharing.[6]

In one aspect, the critics are correct - resource sharing cooperatives in Massachusetts infrequently, if ever, conduct evaluations. There may be a couple of reasons for this. Several of the cooperatives, particularly the clusters, are seemingly in a constant state of development. How can activity be measured, clusters ask, when the system and the libraries are not "fully operational?" Secondly, conducting an evaluation requires careful planning and substantial time, especially if the statistics needed cannot be generated from the computer system in use. In addition, the evaluation process is usually one of the last activities required of a grant. Many librarians have spent so much time and effort implementing the project that expending more resources to evaluate something when they "know [it] works" is not attractive. Lastly, librarians are seldom adequately trained in evaluative techniques.

However plausible the reasons, the process of automating is not complete without evaluation. Evaluation should be integrated into the operation of the cooperative.

There are two broad categories of statistical data needed by cooperatives - inputs into the effort such as the budget and staffing needs; and outputs useful in evaluating services provided to the user. Outputs include, among many measures, the time it takes to obtain materials and the availability of material for use. If the ultimate goal of any cooperative resource sharing project is to increase and improve services to the user, evaluation should be based partially upon measuring the differences in service to the user measured before and after the implementation period.[7] The application of output measures to the costs

associated with input measures can be used in cost-benefit analysis to determine if the expenditure of resources is worth the services received.

Massachusetts resource sharing cooperatives which receive funding administered through the Board of Library Commissioners are, as one of the conditions of the grant award, required to submit evaluations based upon the grant application. Library cooperatives which receive funding from the Board of Library Commissioners will not be considered for additional funding to initiate, expand or improve any project if previously agreed upon evaluative data has not been filed.

There are at least two measures which all clusters should minimally include in evaluation reports if the cluster receives funds administered through the Board of Library Commissioners during the State's fiscal year (July through June). Actually, all clusters should maintain these statistics on an annual basis in order to respond to inquiries from municipal and state officials, and library users even if no funds were received from the Board during a fiscal year.

Intra-cluster interlibrary loan should be calculated for each participating library. These figures will illustrate the increase in interlibrary loan among cluster members as a result of the online shared bibliographic database. It can also be used to identify net lenders, net borrowers, and the degree to which the cluster has achieved interlibrary loan load leveling.

A second set of statistics which can be derived from sampling at least once a year measures the interlibrary loan fill rate of cluster libraries. Clusters should be able to examine interlibrary loan requests generated by library users to determine the time required to fill the request, and whether the request was filled by another cluster member, or from a library outside of the cluster. For example, Library A examines 100 interlibrary loan requests. Thirty-five were filled within fourteen days of which thirty-four were intra-cluster fills and one from another Massachusetts library; fifty were filled within fifteen to twenty-eight days, thirty of which were intra-cluster and twenty from outside the cluster, eight of the twenty came from outside of Massachusetts; two were filled in twenty-nine to fifty-six days, both from other Massachusetts libraries; and thirteen remain unfilled. Such statistics will indicate the cluster's ability to fill interlibrary loan requests, and also provide information about the length of time required for request to be satisfied.

A third evaluative measure is required of all public libraries in the Commonwealth through one of the Board of Library Commissioners' state aid to public libraries programs - the circulation of materials to non-residents. Non-resident use has increased during the past decade, and non-resident use of cluster-affiliated public libraries has increased more than non-resident use of public libraries which are not members of clusters. Statistics generated and analyzed will provide insights as to patron usage patterns, and may become most useful in evaluating intra-cluster patron usage when public access catalogs, either online or employing optical disk technology, are introduced in the library.

Although these three measures - intra-cluster interlibrary loan, interlibrary loan fill rates, and circulation of materials to non-resident users have been discussed in terms of cluster evaluation, other cooperative projects such as union lists of serials and libraries using microcomputers to access cluster databases may be able to modify the measures somewhat to

become applicable for evaluative purposes.

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee should be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations.

ENDNOTES

1. Eleanor Montague, "Evaluation Studies of Resource Sharing and Networking Activities," p. 291.
2. Ruth J. Patrick, Guidelines for Library Cooperation: Development of Academic Library Consortia, p. 153.
3. Eleanor Montague, "Evaluation Studies of Resource Sharing and Networking Activities," p. 291; and James G. Williams, "Performance Criteria and Evaluation for a Library Resource Sharing Network," pp. 230-56.
4. James C. Williams, "Performance Criteria and Evaluation for a Library Resource Sharing Network," pp. 258-65; and Ruth J. Patrick, Guidelines for Library Cooperation: Development of Academic Library Consortia, p. 154.
5. Donald Sager, "The Economics of Library Automation: The Agony and the Ecstasy," p. 9.
6. Thomas H. Ballard, "Dogma Clouds the Facts," pp. 258-9.
7. Daniel O. O'Connor, "Network Statistics: A Statistical Model for Data Analysis and Networks," p. 78.

19. ROLE OF THE MASSACHUSETTS BOARD OF LIBRARY COMMISSIONERS

The Massachusetts Board of Library Commissioners is the state agency possessing the statutory authority and responsibility for library development in the Commonwealth. In this position, the Board initiates, establishes, and exercises primary leadership for, and direction of, the Commonwealth's effort to develop and improve library resources and services.

Chapter 78, section 19E of the General Laws provides the Board with the authority to "establish a comprehensive statewide program for the improvement and development of library and media resources for all citizens." In developing this comprehensive program, the Board is charged to incorporate into that program libraries, media centers, and information activities of all types. Furthermore, the Board has authority to disburse appropriated funds to any library activity, regardless of type or jurisdiction, participating in cooperative activities. Defined as a regulatory and adjudicatory agency by the provisions of the State Administrative Code (Chapter 39A), the Board has the authority to promulgate the necessary procedural and technical standards to effectively develop and coordinate a statewide multitype library network.

Clearly, the Board of Library Commissioners has the responsibility and legislative mandate to plan, develop, establish, implement, coordinate, monitor, and evaluate an automated resource sharing, multitype library network for the Commonwealth. It is recommended that the role of the Board in relation to the network be:

1. To implement the automated resource sharing network program by assuming responsibilities for the overall development and coordination of network activities and aspects of the network as appropriate.

   This is a broad role, encompassing all aspects of resource sharing in Massachusetts. For example, the Board has the responsibility of encouraging and/or initiating where and when necessary, and expanding as technologically and economically feasible, resource sharing efforts throughout the State. It also has the responsibility to improve and coordinate communication between and among the various network components, such as clusters and union list of serial projects.

   The Network Advisory Committee has been established to assist the Board in this communication function by serving as a standing Committee of representatives from all types of libraries and resource sharing efforts As an issues forum, the NAC will assist the Board in identifying issues related to resource sharing activities, and work towards their resolution. Further, the NAC will assist the Board in developing and implementing an evaluation process of the progress that the various network components have made toward increasing access to informational sources and improving services to the State's residents.

   Although it would tremendously improve coordination and communication among and between the clusters, the Board of Library Commissioners will not standardize on one automation vendor for the provision of shared circulation/ILL services. It is acknowledged that the various application/functional needs of

the numerous clusters and their participants cannot be supplied by one vendor. However, the Board of Library Commissioners should be able to exercise some influence over the vendor choice to insure that funding administered through the Board is appropriately expended on a computer system that will function as envisioned. Therefore, the Board of Library Commissioners reserves to itself the authority to disapprove of a cluster's choice of vendor for shared circulation/ILL services.

2. to draft and propose legislation and seek funding to facilitate the development and growth of the network.

More than any other issue, funding dominates automated resource sharing. Further, many legislative initiatives proposed usually involve establishing or increasing funding for resource sharing purposes.

Most librarians view legislative initiatives as a major responsibility of the Board of Library Commissioners. Legislation is intended as a legal mechanism in order to accomplish specific objectives that need such a legal framework. Amending existing legislation involving cable television (Community Antenna Television Systems - CATV), for example, is intended to facilitate inter-municipal data communications which may enhance intra-cluster communications. Along with legislative responsibilities, the Board of Library Commissioners is concerned with regulatory issues, amongst them the standards associated with public library state aid programs. Regulations which obstruct resource sharing efforts should be identified and resolved.

Another area of major responsibility is funding. Despite the level of funding support for resource sharing efforts provided through the Board of Library Commissioners, the lack of funding availability remains one of the major barriers to increased resource sharing in the Commonwealth. It is expected of the Board of Library Commissioners, by the library community and the Board itself, that new and ongoing sources of funding which may benefit resource sharing activities be continually sought, especially through the State Legislature.

3. to act upon the recommendations of the Statewide Advisory Council on Libraries (SACL) as applicable to the Long Range Program or activities and aspects of the network.

SACL is responsible for providing recommendations to the Board concerning the annual and long range federal programs. In addition, their activities include providing recommendations to the Board concerning the the allocation of State competitive grant funding when available through the Legislature. Because of its statutorily mandated planning and evaluation responsibilities, SACL has an important role in providing recommendations to the Board of Library Commissioners concerning automated resource sharing in Massachusetts.

Many organizations and agencies are involved in the resource sharing effort in Massachusetts including, but not limited to, consortia, clusters, dial-up libraries, NELINET, the regional public library systems, the

Statewide Advisory Council on Libraries, and private and public academic institutions. In a 1986 survey on library needs, respondents gave "role clarification and definition" of the various service and administrative elements in the library community a low priority (ranked 41 out of 51). However, librarians and others are continually asking for clarification of the numerous and varied roles and responsibilities library service providers in the Commonwealth. Therefore, an effort should be considered to identify library service providers and request information on their roles and responsibilities. That information could lead to a lively discussion which may result in clarification of outdated, existing and planned roles and responsibilities.

20. NETWORK ADVISORY COMMITTEE

Included among the recommendations in the first Automated Resource Sharing Plan was the establishment of the Network Advisory Committee (NAC) charged with providing advice, submitting reports and recommendations, and providing evaluations to the Board concerning network activities.[1]

The Plan further recommended that the Network Advisory Committee be composed of representatives of libraries participating in the network as well as representatives of professional and administrative library organizations. Over the past years the Network Advisory Committee has clarified and revised the criteria for membership from the first Plan which appears in an Appendix to this document.

The organizational meeting of the NAC was held on November 15, 1983, with representatives of 28 designated organizations in attendance. An eight member steering committee was chosen to draft a formal structure for NAC review. The Steering Committee presented Operational Guidelines at the second meeting of the full Network Advisory Committee on March 26, 1984. The Operational Guidelines approved at that meeting detailed the duties and responsibilities of the NAC, the criteria for membership, the Role of the Executive Committee, and the purposes and responsibilities of eight standing committees. The members of the Executive Committee were also appointed at that meeting.

The first meeting of the new Executive Committee was held on May 24, 1984. Donald J. Dunn was elected chair, standing committee assignments were made, six dates were set for Executive Committee meetings, and three full NAC meetings were scheduled. The formative process was complete.[2]

The full NAC met four times under during Donald Dunn's tenure as Chair. In addition to committee reports, and updates on statewide development from the MBLC staff, there were two substantive programs - one on electronic mail systems and one on integrated library systems in Massachusetts. Programs were coordinated by the Education and Current Awareness Committee. The Plan Analysis and Evaluation Committee surveyed resource sharing participants about their cooperatives' governance structures and collected for future reference, the bylaws of those groups. The Public Relations Committee sent press releases about its members to local newspapers and the Standards Committee developed a checklist for entitled "Points to Consider When Developing Cooperative Agreements Among Libraries" (See APPENDIX).

Marge Fischer assumed chairmanship of the NAC at the October 10, 1985 meeting. The main topic of discussion at that meeting was the first draft of the Title III section of the Long Range Program. Included as an objective under Title III was the revision of the Plan. At its April 10th, 1986 meeting, the Network Advisory Committee approved the revision process.

The year's activities included two education programs. MEDLINK representative Steve Hunter provided a demonstration of of electronic mail-teleconferencing services, online ILL services, and the various ALANET services on January 14th. A survey to determine the level of interest in electronic mail among NAC members followed that meeting, but there was insufficient interest to support the development of the service. On April 10, the Education and Current Awareness Committee presented a panel discussion entitled "Network Management: The Art of Consensus Building."

Changes within an organization are inevitable as it matures. During the first full year of operation, the various standing committees experienced overlap in areas of interest and responsibilities, a problem which lead to duplication of effort and diffusion of role recognition. The eight standing committees were restructured into four larger committees as a test o. a more workable organizational structure.[3]

Benjamin Hopkins was elected Chair for 1986-87, a year in which the revision of the Plan became the NAC's major activity. As a prelude to the revision process a series of six "Open Forums" were held statewide in order to solicit input from the library community. At each of the Forums, participants expressed the need for communication among the various network participants. It was suggested that committees should be established to provide network participants a vehicle for discussion of common concerns.

It became obvious that the Network Advisory Committee was not serving as an information exchange for its members and that it is the most logical conduit for the passage of information to libraries of all types.

Therefore, the Executive Committee at its December, 1986 meeting proposed changes to the NAC Operational Guidelines (included as an appendix to this document) and organizational structure. Their proposal, which was approved at the January, 1987 full NAC meeting eliminated the standing committee structure entirely. All future NAC meetings will have an open forum period included as an agenda item. As needs are identified, the Executive Committee will appoint special study committees which will report their findings to the full Network Advisory Committee.

Although the Network Advisory Committee has undergone great change since its inception, the organization remains viable. It has been flexible enough to alter its structure to better serve the needs of its members and in three years the number of actively participating member organizations has grown from 28 to 40.

ENDNOTES

1. Robert Dugan, Automated Resource Sharing in Massachusetts: A Plan, pp. 68, 81.
2. Network Advisory Committee, Annual Report, 1985.
3. Network Advisory Committee, Annual Report, 1986.

The Mission Statement should be reaffirmed and the revised Statement of Related Activities should be adopted:

> Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. **develop access points into informational resources, and develop and link databases to provide greater access opportunities to resources**

All libraries are encouraged to convert their holdings into machine-readable form through a utility or by using another process, service or product. (Chapter 10, p. i, 1.1)

The following minimum activities should be offered by a bibliographic utility or service center to be considered as providing cataloging/ILL services:

a. online in realtime access to machine-readable bibliographic records from various sources including the Library of Congress and from original cataloging from participating libraries
b. supports AACR II
c. supports full MARC format
d. provides access to the bibliographic records of all participating libraries including local holdings information
e. supports standard, ASCII terminals and microcomputer-based dial access with common terminal emulations
f. supports query by search key (author, title, and others)
g. supports online entry of interlibrary loan requests through an interlibrary function module
h. provides union list capability by definable parameters
i. can be interfaced with local circulation control/online systems.

(Chapter 10, p. 2, 1.1.1)

All clusters which have received in excess of 50% of the costs associated with the acquisition and/or upgrade of the central site computer system should utilize a bibliographic utility or bibliographic service center as the primary or secondary source of machine-readable records. It is recommended that clusters consider establishing centralized cataloging centers to facilitate conversion of participating libraries' acquisitions through bibliographic utilities. (Chapter 10, pp. 2-3, 1.1.2; Chapter 15, pp. 5,8)

It is important that clusters develop and maintain telecommunications linkages with bibliographic utilities for conversion. An interface may be needed for the online in realtime transfer of machine-readable bibliographic records processed during conversion. Therefore, clusters may request funding, as available and feasible, for the capital costs of developing an online in realtime interface for conversion purposes with bibliographic utilities recognized as such. (Chapter 10, p. 30, 1.11.3)

Cooperative library groups receiving funds from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install a system that supports AACR2; accepts, retains, and outputs records in the U.S. MARC format; and can support necessary bibliographic authority control. Libraries receiving funds administered through the Board of Library Commissioners to access the clusters' bibliographic databases should agree to convert their ongoing acquisitions utilizing the U.S. MARC format and AACR2. (Chapter 11, p. 1)

1. Any cooperating group of libraries receiving funds administered through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should have a full U.S. MARC record format bibliographic database. Library clusters which have, or plan to have, less than the full U.S. MARC record format as their database will not be considered for funding. (Chapter 15, p. 3)

2. Resource sharing cooperatives should adopt standardized holdings statements as they become available and should strongly encourage vendors to incorporate the standards into their systems. (Chapter 11, p. 1)

To assist retrospective data conversion for libraries in Massachusetts, cooperating library groups receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with the central site system or equipment upgrade should allow, for a period of time and under conditions as specified on the contractual agreement between the cluster and the Board of Library Commissioners, network participants to copy the database at their cost for use in their own conversion projects. However, such an effort should be considered within the issue of copyright protections claimed at the time by OCLC. No cluster will be required to provide all or part of its database for copying by another network participant if OCLC claims it would infringe upon their copyright, whether or not the copying and transfer of the database would, in actuality, violate copyright. (Chapter 15, p. 3)

OCLC/NELINET or UTLAS, Inc. are recommended as bibliographic utilities. (Chapter 15, p. 6)

The Board of Library Commissioners will consider cluster requests for portions of the capital fund, as available and appropriate, directly related to making a bibliographic utility and/or cluster's circulation/ILL control system's database more accessible for libraries to utilize for conversion and interlibrary loan purposes. (Chapter 10, p. 3, 1.1.5; Chapter 15, p. 9)

Retrospective conversion of collections of a general nature is the responsibility of the local library. Retrospective conversion of special collections considered unique in content will be considered for State funding (as available) for cluster participants. Library cooperatives which include public libraries as full members will be considered for State funding, as available and appropriate, if the converted machine readable records would be made accessible through a bibliographic utility and/or a cluster system. (Chapter 10, p. 3, 1.1.3; Chapter 15, p. 4)

Conversion of current acquisitions is a local responsibility. (Chapter

10, p. 3, 1.1.4)

To provide increased access to the NEULS union list of serials for all libraries, it is recommended that NEULS participants make their offline union list products available to other libraries on a cost recovery basis. Offline products include lists in print format and CD ROM. (Chapter 10, p. 4, 1.2.1)

It is recommended that the Board of Library Commissioners encourage the development of an offline combined union list of serials of Massachusetts NEULS participants on CD ROM, to be made available to all libraries on a cost recovery basis. A printed version is considered to be impractical because of the size. (Chapter 10, p. 4, 1.2.1)

There are other union list of serials projects in addition to those on NELINET's NEULS. To expand the holdings of the NEULS database to be as comprehensive as possible, other union list of serials projects will be considered for funding by the Board of Library Commissioners if the converted bibliographic records are also included in a NEULS database. (Chapter 10, p. 4, 1.2.2)

Libraries are encouraged to explore reference/source database searching. The Board of Library Commissioners will consider requests for capital funding, as available from State sources, for a microcomputer, modem, terminal emulation software and initial training to initiate reference/source database services. Funds will not be available for any continuing or operational costs associated with the searching process. (Chapter 10 p. 5, 1.3)

Expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed. (Chapter 10. p. 5, 1.4)

Because of the importance of circulation/ILL control system clusters in facilitating resource sharing, existing clusters should be expanded in size and scope to include more libraries as participants when and where it is feasible, considering hardware, software, and other factors. (Chapter 10, p. 6, 1.4)

When it is not feasible to include more participants in existing clusters, new, shared online circulation/ILL control system clusters should be encouraged and developed. (Chapter 10, p. 8, 1.4)

The Board of Library Commissioners should provide state and federal funding, as available and feasible, for the capital costs associated with establishing or upgrading the central site computer system of a circulation/ILL control system cluster to increase the number of participating libraries as access points, or for the establishment of new clusters when necessary. Funds can only be used for the central site computer system and software, its installation, and the training of personnel. Funds will not be provided for equipment, software, or for a service which serves the needs of an individual institution. Funds will not be provided for central site preparation costs, nor for the operations of the cluster. Federal funds cannot be applied toward telecommunications equipment. (Chapter 10, p. 8, 1.4.1)

Clusters should not be established without assistance from a consultant experienced in the process. Cooperatives planning to establish

a cluster may apply for federal funding administered through the Board of Library Commissioners for a consultant to assist in planning the cluster, the development of system specifications and the issuance of the Request for Proposals, vendor negotiations, and system acceptance testing. (Chapter 10, p. 8, 1.4.2)

Library cooperatives applying for funding from any source administered by the Board of Library Commissioners to establish or expand a cluster circulation/ILL control system should consider the following requirements as minimum criteria when selecting a vendor's system.

a. should be capable of accepting, maintaining and outputting a U.S. MARC record
b. provides the member libraries with inventory control of library material through an automated circulation control function
c. provides bibliographic and holdings information about materials owned by cluster members
d. facilitates interlibrary loan and resource sharing by having the capability of providing online availability status information of the materials in the database to all libraries belonging to the cluster
e. should be capable of providing multi-tier intra-cluster searching within the database. For example, the system should be able to minimally display the holdings of individual libraries, then a second level of holdings of other libraries as specified in parameter tables, and then a third level in which the holdings of all cluster libraries are displayed.
f. should have an electronic messageing facility for intra-cluster messages such as interlibrary loan requests
g. should have an online public access catalog capability
h. system should be capable of generating various statistical reports including non-resident circulation for public libraries
i. system should be physically expandable to accommodate additional libraries and functionally expandable to accommodate additional applications software
j. system should be capable of providing communication gateways to reference/source database services and electronic mail systems from most terminals in use on the system
k. should be able to implement the protocols from the Library of Congress' Linked Systems Project
l. should be able to remove and transfer the MARC bibliographic database to another computer system without loss of data and format
m. the system should be capable of accommodating dial-up access to the bibliographic database from libraries and from users in business and home environments

Only "turnkey" systems implementing an "off the shelf operating system and software" will be acceptable for funding administered through the Board of Library Commissioners. (Chapter 10, pp. 8-9, 1.4.3)

Although, it would improve inter-cluster communications and coordination and dramatically facilitate resource sharing, the Board of Library Commissioners will not standardize on one vendor to provide circulation/ILL services for the Commonwealth's clusters. However, to ensure that a cluster acquires appropriate functional hardware and applications software, the Board of Library Commissioners reserves the right to disapprove of a cluster's choice of vendor if it has provided

funds to the cluster in excess of 50% of the costs associated with the establishment or upgrade of the central site computer system. (Chapter 10, pp. 9-10, 1.4.4)

Clusters which have received in excess of 50% of the costs associated with the establishment or upgrade of the cluster's central site computer system with funds administered by the Board of Library Commissioners should accommodate dial-up access from other Massachusetts clusters and non-cluster libraries as appropriate and feasible, negotiated between the cluster and the Board of Library Commissioners. (Chapter 10, p. 10, 1.4.5)

All clusters which have received in excess of 50% of the costs associated for the establishment and/or upgrade of the central site computer system with funding administered through the Board of Library Commissioners should provide access to their bibliographic and holdings information databases for non-cluster libraries. (Chapter 10, p. 11, 1.5)

Clusters which have received funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with establishing and/or upgrading the central site computer system should set aside five percent of all the system's ports, but no more than eight and no less than three, for access by libraries using microcomputers on a dial-up basis. Clusters should be willing to implement dial-up access. The Board of Library Commissioners should consider providing the necessary funding, from State sources as available and appropriate, to enable the clusters to acquire adequate central site computer equipment to accommodate dial-up access. (Chapter 10, p. 11, 1.5.1)

Clusters should establish incoming toll-free lines into their central site for use by dial-up access libraries so that telecommunications costs do not become a barrier for libraries to access the bibliographic and local holdings information databases. The Board of Library Commissioners will consider allocating State funds, as available, to partially support the necessary centralized telecommunications costs of dial-up access. (Chapter 10, p. 11, 1.5.1)

Libraries wanting to implement dial-up procedures are encouraged to acquire the appropriate computer system to access the circulation/ILL services of the cluster. The recommended minimum system configuration will be determined based upon the technology available at the commencement of the grant round.

The Board of Library Commissioners will consider requests from libraries to acquire this configuration when State funds are available for categorical grant purposes. If a library receives funds administered through the Board of Library Commissioners, the library should meet the following criteria:

1. agree to the annual fee assessed by the cluster
2. accept reasonable guidelines and procedures to access the cluster's database, outlined in an agreement between the cluster and the library
3. obtain written acknowledgment that the cluster can accommodate an additional dial-up member.
4. agree to input their current acquisitions into the cluster's database and/or into a bibliographic utility providing cataloging/ILL services accessible by the cluster.

It is recommended that the clusters allow dial-up libraries to

contribute their holdings to the cluster's database. If necessary, the cluster may request funding administered by the Board of Library Commissioners to acquire the mass storage devices necessary to store the MARC records of the dial-up libraries.

5. agree to participate as a dial-up member for no less than three years, unless the library becomes a member of a cluster, or decides to return the computer system to the Board of Library Commissioners.
6. agree to purchase the specific hardware and software recommended by the Board of Library Commissioners, such as the computer model and internal configuration, communications software, and modem.
7. agree to attend the appropriate training program implemented by the cluster, and/or the regional public library system, and the computer system vendor(s). (Chapter 10, pp. 12-13, 1.5.2)

An alternative to dial-up access is to make copies of the cluster's database available for libraries to search locally. Clusters could arrange to periodically have their databases mastered and then distributed on CD ROM. Copies of the CD ROM database could be distributed to other clusters, and sold on a cost recovery basis to non-cluster libraries. (Chapter 10, p. 14, 1.5.4)

Online public access catalogs should be installed and implemented in clusters when economically and technically feasible to increase access to users of the bibliographic and other database files available, and improve resource sharing efforts. The Board of Library Commissioners may consider requests from clusters for State and federal funding, as available and appropriate, to acquire central site hardware and software to implement online public access catalogs. Requests for funding for local costs such as terminals, and costs for any site preparation, operations and telecommunications are not appropriate. (Chapter 10, pp. 17-18, 1.6.1)

Because of anticipated technical and economical considerations of providing online public access catalog terminals, it is recommended (not required) that clusters consider a public access catalog program combining online public access catalog terminals, inquiry terminals and CD ROM databases. (Chapter 10, p. 19, 1.6.2)

Because of the potential for dramatically increasing access by library users to cluster bibliographic databases and the enhancement of the libraries' public image, it is recommended (not required) that clusters consider providing library users with the opportunity for dial-up access. If available, unused or underutilized ports which have been reserved on the central site computer systems for dial-up access by libraries may be reallocated for library user dial-up access, if technically feasible, and considering security issues. (Chapter 10, p. 20, 1.6.3)

Clusters are encouraged to consider the advantages and disadvantages of the utilization of a centralized telecommunications switch to facilitate dial-up access by library users. If this or a similar configuration has potential for use, two or more clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, an exploration of its functionality and applicability through a pilot project. (Chapter 10, p. 20, 1.6.4)

Equipment and software which facilitates the searching of standalone databases by clusters and/or by other standalones should be installed when

economically and technically feasible. The Board of Library Commissioners will consider requests for funding, as available and appropriate, for projects which promote the reciprocal exchange of bibliographic and/or item information between standalones and clusters and between standalones of at least two types of libraries. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality. (Chapter 10, pp. 20-21, 1.7.1)

Clusters are encouraged to consider loading and/or creating other informational files in addition to the monograph bibliographic database for inclusion on their central site circulation/ILL control systems. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, to initially tape load or create a database which would improve and increase access to informational resources for library users. (Chapter 10, p. 21, 1.8.1)

Clusters should consider developing an integrated system which includes the following functions: acquisitions, cataloging, circulation, public access catalogs, serials, and resource sharing. Resource sharing includes intra-cluster electronic messageing, and the provision of gateways to other computer systems. Other informational database files should also be considered for inclusion such as information and referral files. The Board of Library Commissioners will consider requests for funding from clusters, as available and appropriate, for the necessary central site computer hardware and software to implement functions of an integrated system. The circulation and resource sharing functions should be present before other functions will be considered. (Chapter 10, p. 23, 1.9.1)

Clusters should consider and explore the possibilities of remote distributive processing. Clusters may request that the Board of Library Commissioners consider funding, as available and appropriate, for pilot projects to demonstrate remote distributed processing. Funds can be utilized for necessary central site hardware and software modifications required to implement remote distributive processing and the remote computers for no more than three of the cluster's libraries. Site preparation, telecommunications and operational costs are local expenses. (Chapter 10, p. 25, 1.10.1)

The Board of Library Commissioners encourages the consideration of clusters, non-cluster libraries, and vendors in developing microcomputer-based systems which would be compatible and/or interfaced with clusters to facilitate resource sharing. The Board of Library Commissioners will consider requests from libraries and/or clusters for funding, as available and appropriate, for a pilot project to develop such a system as described. (Chapter 10, p. 27, 1.10.2)

Clusters are encouraged to make an effort to establish inter-cluster communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. Clusters may request the Board of Library Commissioners to consider for funding, as available and feasible, pilot projects establishing inter-cluster linkages based upon LSP protocols to facilitate resource sharing efforts. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented. In addition, contracting libraries which directly provide interlibrary loan services to members in the regional public library systems may apply for funding administered by the Board of Library

Commissioners, as appropriate and available, for a microcomputer and appropriate software which will be used to access cluster systems other than their primary cluster. (Chapter 10, p. 29, 1.11.1)

Linkages between cluster systems and standalone circulation (or online catalog) systems, and between individual standalone circulation (or online catalog) systems exhibit problems similar to those of inter-cluster linkages. Reciprocal access between clusters and standalones and between standalones would facilitate resource sharing. (Chapter 10, p. 29, 1.11.1)

Clusters and standalone circulation (or online catalog) systems are encouraged to establish communications for resource sharing purposes. The protocols of the Linked System Project should serve as the basis for these linkages whenever possible. The Board of Library Commissioners will consider for funding, as available and feasible, pilot projects establishing linkages between clusters and standalones, and between standalones of at least two types of libraries, based upon LSP protocols to facilitate resource sharing efforts. Funds will not be considered for the purchase of equipment, software, or a service which serves the needs of an individual institution or a cooperative funded by a single municipality. Other pilot projects using alternative methodologies and procedures will be considered if LSP protocols cannot be implemented. (Chapter 10, p. 29, 1.11.2)

In order to enhance network telecommunications:

1. It is recommended that the Board of Library Commissioners request the General Court to increase the existing state funding level in order to reduce the costs associated with the telecommunications links within clusters, between clusters, and between dial-up libraries and the clusters. (Chapter 12, p. 5)

2. Any cluster receiving funds administered through the Board of Library Commissioners which exceeds 50% of the costs to establish and/or upgrade central site equipment should utilize a computer system that is capable of contentioning computer system ports. Any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment may only apply that funding toward a telecommunications configuration capable of contentioning with the cluster's central site computer system. (Chapter 16, p. 3)

3. To improve telecommunications costs and reliability, any cluster which receives funding administered through the Board of Library Commissioners for telecommunications equipment should have in place a telecommunications configuration which utilizes as few lines as possible between and among cluster members and the central site, and should have a configuration which can bypass temporarily-failed (fours hours or more) telecommunication links so that a library still has no less than 20% of its terminals (libraries with four or less terminals should have at least one terminal) connected online in realtime to the central site. (Chapter 16, p. 6)

4. Whenever possible, toll-free lines should be established at the cluster central site to reduce the telecommunications

costs between the remote dial-up access library and the cluster. The Board of Library Commissioners will endeavor to secure State funds to partially offset the costs of the toll-free lines. (Chapter 10, p. 30, 1.11.4)

5. Legislation which would permit inter-municipal linkages of CATV systems for the purpose of data communications should be drafted and filed. The Board of Library Commissioners should charge the Network Advisory Committee with preparing a draft of the proposed legislation for approval by the Board of Library Commissioners. (Chapter 14, p. 2)

6. There is a need in Massachusetts to link the various circulation/ILL control system in order to facilitate resource sharing. If clusters implement the protocols from LSP, librarians and library users will be able to search the bibliographic databases of the numerous clusters to identify the wanted sources, and to ascertain availability status. Such information should decrease the turnaround time of the interlibrary loan process. Several vendors are planning to implement the protocols from LSP, and full recognition and support of these protocols will encourage its development. Therefore, cooperative library groups receiving funds after July 1, 1989 from the Board of Library Commissioners in excess of 50% of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to install or upgrade only those systems which have successfully passed the compatibility tests conducted through the test facility hosted by the Library of Congress. (Chapter 11, p. 3)

It is recommended that cooperatives formally organize themselves under articles of incorporation. Specifically, library cooperatives in Massachusetts should organize themselves as non-stock, non-profit corporations under Chapter 180 of Massachusetts General Laws. In addition, all library cooperatives should file for federal tax exempt status under Internal Revenue regulation 501 (c) (3). Library cooperatives wishing to be considered for funds administered through the Board of Library Commissioners for resource sharing projects should be established as a non-profit organization under Chapter 180, and cooperatives planning to purchase circulation/ILL control system central site equipment should additionally have federal tax exempt status.

Further, it is recommended that library participation in resource sharing efforts (such as circulation/ILL control systems, accessing a cluster via dial-up, a union list of serials cooperative, utilizing a bibliographic utility, etc.) with other libraries, vendors, service providers, state government or others be based upon formal written agreements or contracts minimally defining individual and cooperative responsibilities. (Chapter 13, p. 2)

Intra-cluster resource sharing and access to information sources can be improved if members approve and utilize cluster-wide collection development and management policies. All automated resource sharing clusters which have received funding administered through the Board of Library Commissioners in excess of 50% of the costs associated with the establishment and/or equipment upgrade of the central site computer system, should have membership-approved collection development and management

policies, approved as to form by the Board's staff, in place by January 1, 1990. Because collection development and management policies should be proceeded by collection surveys, clusters may be considered for funding (as available and not to exceed $100,000 per cluster) to conduct analyses of members' collections to identify strengths and weaknesses, and to assist in preparing the policies. Other library cooperatives may also be considered for funding (as available and not to exceed $100,000) to conduct a member collection survey. (Chapter 17, pp. 3-4)

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee should be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations. (Chapter 18, p. 4)

2. facilitate document request and document delivery procedures

The interlibrary loan and information transmission process, including identification of bibliographic items, document request procedures, the handling of the request by the owning library, document delivery, and the return of the document to the owning library should be studied in order to increase effectiveness and efficiency. Library cooperatives, consortia, clusters or the regional public library systems may request funding, as available and appropriate, administered by the Board of Library Commissioners, to examine all or part of the interlibrary loan and information transmission process. (Chapter 10, p. 33, 2.0.1)

The most efficient manner in which to transmit an interlibrary loan request is by sending a request electronically to the identified owning library. Whenever possible, libraries should submit interlibrary loan requests in an electronic format. (Chapter 10, p. 33, 2.1)

Clusters which receive funds administered by the Board of Library Commissioners in excess of 50% of the costs associated with acquiring and/or upgrading the hardware and/or software of the central site computer system should have an intra-cluster electronic mail system usable in the interlibrary loan process available within the computer system. (Chapter 10, p. 3[illegible]-35, 2.1.1)

It is recommended that ALANET become the common electronic mail system for Massachusetts libraries. It is recommended that clusters develop gateways for members to access ALANET from their central site computer systems. It is suggested that bibliographic utilities also develop gateways to this important library electronic mail system. (Chapter 10, p. 36, 2.1.2)

The Board of Library Commissioners will consider, on an annual basis, depending upon the availability of State funds, requests from libraries to join ALANET. Funding administered through the Board of Library Commissioners may only be used for initial start-up costs associated with joining ALANET; requests for the purchase of equipment, software, or a service which meets the needs of an individual institution will not be considered appropriate. Libraries participating in this program must agree to utilize ALANET for resource sharing purposes and must pay for all other costs for a period of not less than two years. (Chapter 10, p. 36, 2.1.2)

The document delivery mode chosen to fill a request should utilize the fastest, least expensive, and most reliable means of information transmission available. (Chapter 10, p. 37, 2.2)

Library consortia may request that the Board of Library Commissioners consider requests for funding, as available and appropriate, for pilot projects to demonstrate the applicability and functionality of telefacsimile for document delivery. Pilot projects cannot involve more than twenty-five percent of the consortia membership. Projects should be based upon the employment of an existing union list(s) to identify and locate requested items. Funds may be allocated for acquiring equipment only and cannot be utilized for operational, telecommunications and maintenance costs. Projects must run for no less than two years. Equipment must be returned in working order to the Board of Library Commissioners if the project operates for less than the two year period. Extensive cost and usage evaluations of the progress of the pilot project will be required. The Board of Library Commissioners will consider requests for funding to expand successful pilot projects after the pilot project has terminated and evaluative data has been submitted for review. (Chapter 10, p. 40, 2.2.1)

It is recommended that libraries desiring telefacsimile capability acquire CCITT Group III equipment with downgrade compatibility to at least Group II to be compatible with the facsimile being used in other libraries.

It is further recommended that Group IV standards be adopted as soon as CCITT releases them, and that consideration be given to acquiring Group IV machines as economically feasible. (Chapter 11, p. 2)

In some resource sharing instances, such as inter-cluster resource sharing, fees for interlibrary loan may be imposed based upon cooperative arrangements because the frequency and need for continuous cooperation with each other and/or the materials to be loaned may not be appropriate without cost. The fees should be reasonable and reflect cost recovery or reimbursement. Additionally, it is recommended that the fees be assessed against individual libraries, not the cluster as an entity, unless agreed to in the cooperative agreement. Clusters and, for that matter, standalone systems should carefully consider the imposition of interlibrary loan fees, even on a cost recovery/reimbursement basis, when transacting among and between each other. A quid pro quo system of free interlibrary loan is desirable. (Chapter 12, p. 9)

It is recommended that the Board of Library Commissioners prepare legislation which would establish a state budget account for partial reimbursement to heavy interlibrary loan net lenders, excluding intra-cluster interlibrary loan. Secondly, it is recommended that the Board of Library Commissioners continue to seek a state budget account supporting the legislation passed in 1987 which enables partial reimbursement of public libraries with substantial circulation of materials to non-residents. (Chapter 12, p. 7; Chapter 14, pp. 1-2)

3. develop an ongoing education program on resource sharing

The Network Advisory Committee should conduct a continuing education needs assessment of issues related to resource sharing, identify potential providers, and coordinate an education program with those providers to

increase the opportunities for librarians, trustees, library governing officials, and other administrators to become more familiar with automation and resource sharing activities. (Chapter 10, p. 41, 3.1)

Library consortia may request funding, as available and appropriate, from the Board of Library Commissioners to conduct educational programs about issues concerning resource sharing and/or automation. Such programs should be conducted without attendance fees for participants (costs for necessary materials for individual use, such as workbooks would be allowable). Further, the consortium should be able to reproduce the program on videotape and/or make the program available to remote sites using teleconferencing techniques. (Chapter 10, pp. 41-42, 3.2)

A library consortium may request funding, as available and appropriate, from the Board of Library Commissioners to conduct training and/or continuing education programs for its membership. Such programs should be of such content and scope as to be of interest and utility for other library consortia in the state, and should be available for dissemination via interlibrary loan at no charge. (Chapter 10, p. 42, 3.3)

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POINTS TO CONSIDER WHEN DEVELOPING COOPERATIVE ARRANGEMENTS AMONG LIBRARIES

1. Statement of Purpose

   A. Name of organization
   B. Network exists for what purpose?

2. Contract with Vendor

   A. Name
   B. Append agreement for purchase and maintenance
   C. Confidentiality of vendor software and documentation

3. Use of the System

   A. Development among network members of procedures for system use
   B. Availability of system to network members
   C. Network responsibilities for management & operation
   D. Possible network liability for damage resulting from equipment malfunction

4. Payment

   A. How the network is to fund itself
   B. What individual members pay
   C. What the network pays
   D. What is shared and how it is shared (see appendix)

5. Insurance

   A. Responsibility for insurance costs for central site equipment
   B. Responsibility for individual members equipment

6. Title/Owership

   A. What is owned by the network
   B. What is owned by the individual libraries
   C. What happens if network is dissolved

7. Membership

   A. Who can become a member
   B. When can a member join
   C. Type of membership
   D. Responsibilities of members
   E. Withdrawal from membership
   F. Meeting network standards

8. Housing & Operation at Central Site

   A. Location
   B. Hours of operation
   C. Procedure for change in hours of operation
   D. Staffing
   E. Possible liability of central site for downtime due to system malfunction
   F. Data base security and back-up

9. Amending written arrangements, agreements, etc.

10. Breach of Contract

11. Settlement of Disputes

12. Access to the Data Base

   A. Patron files (Owner, use & confidentiality)
   B. Non-member use
   C. Ownership of data and removal of data
   D. Sale of the data base
   E. Relationship to other networks

APPENDICES

1. Definitions
2. Contracts with Vendors
3. Payment Schedules
4. Current List of Members
5. Current List of Hours

8/85

MASSACHUSETTS BOARD OF LIBRARY COMMISSIONERS

NETWORK ADVISORY COMMITTEE
OPERATIONAL GUIDELINES

SECTION 1 - AUTHORITY

The Network Advisory Committee is an advisory group appointed by the Massachusetts Board of Library Commissioners as established in its approval of the document entitled Automated Resource Sharing in Massachusetts: A Plan (hereafter referred to as the "Plan").

SECTION 2 - MISSION STATEMENT

The Network Advisory Committee will serve as a forum for the discussion of issues related to resource sharing and networking. As a forum, it will:

A. inform and educate the library community, decision-makers, and others as appropriate; solicit information from librarians, organizations and institutions, decision-makers, and others; and act, when appropriate, upon those issues;

B. assist the Board of Library Commissioners on a continuing basis by providing advice and submitting reports and recommendations concerning the activities and aspects of the network and its "Plan";

C. assist the Board of Library Commissioners, as appropriate, in implementing activities and aspects of the network, including, but not limited to, developing and monitoring standards as necessary, developing network per formance criteria measures, and providing evaluations of network activities and operation; and

D. upon request, assist the Statewide Advisory Council on Libraries (L.S.C.A.) in its advisory functions related to the "Plan", including revision of the "Plan", discussing and prioritizing network activities, and other aspects related to network operations and activities as determined by the Council.

SECTION 3 - DUTIES AND RESPONSIBILITIES

The Network Advisory Committee is a broadly representative body whose duties are to:

A. identify issues and facilitate the exchange of information among Committee members and the groups they represent;

B. inform and educate local librarians about the "Plan", and about the various aspects of resource sharing and networking;

C. inform and educate the community at large of the activities and values of resource sharing, and encourage local librarians to inform and educate their constituents;

D. inform, educate, and advise:

- the Board of Library Commissioners
- library governing bodies, and other administrators, and
- such other decision-makers as are necessary

about the "Plan" and the actions necessary to implement and carry out the "Plan", and about resource sharing and networking;

E. act, when appropriate, with other committees, organizations and institutions, governing bodies and administrators, and others, as necessary, on initiatives, petitions, proposals, policy statements, and such other efforts, about issues related to and concerning resource sharing and networking.

SECTION 4 - MEMBERSHIP

A. Members of the Network Advisory Committee will be appointed by the Board of Library Commissioners according to the following criteria:

1. a full-member representative from each shared automated circulation/ILL cluster whose computer system can be accessed via dial-up recommended by its members;

2. a representative from each standalone automated circulation/ILL system whose computer can be accessed via dial-up;

3. a dial-up member from each circulation/ILL cluster;

4. one representative from the Statewide Advisory Council on Libraries (L.S.C.A.) recommended by its Chairperson;

5. two staff members of the Board of Library Commissioners recommended by its Director;

6. the Regional Administrators from the Regional Public Library System, or their designee;

7. the Chairpersons of the standing Automation Committees of the Regional Public Library System;

8. a representative of the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) recommended by its President;

9. a representative each from the Massachusetts Library Association, the Massachusetts Association for Educational Media, and a Massachusetts member each from the Boston Chapter of the Special Libraries Association and the New England Chapter of the Association of College and Research Libraries, recommended by their respective Presidents;

10. a Massachusetts representative from each cataloging/ILL service recognized as such by the Board of Library Commissioners;

11. a representative from each of the formally organized library resource sharing consortia or groups existing in Massachusetts, recommended by the Chairperson of the consortium or group. Consortia or groups must register with the Library Development Unit of the Board of Library Commissioners; and

12. other appropriate representatives as appointed from time to time by the Board of Library Commissioners.

B. Members are organizations which satisfy one or more of the criteria in Section 4A and are approved by the Board of Library Commissioners. Even if more than one criterion is satisfied, an organization may be represented only once. When appointments to the Network Advisory Committee are made, the criterion applied to the appointment will be included in the notification from the Board of Library Commissioners.

C. Individuals represent organizations, not themselves. An individual may represent only one organization. The organization will designate an alternate to serve in the representative's absence.

D. Each member has one vote. In the event of the absence of the organization's representative, the designated alternate shall cast the member's vote.

E. Membership may be increased in the following manner:

1. an organization seeking membership to the Network Advisory Committee submits a written request to the Executive Committee;

2. the Executive Committee makes a decision on the request and forwards a recommendation to the Board of Library Commissioners;

3. the Board of Library Commissioners acts upon the recommendation and notifies the applicant.

F. The Executive Committee may from time to time review the membership criteria and present a recommendation for change to the Network Advisory Committee. The Network Advisory Committee will then forward its recommendation to the Board of Library Commissioners for action.

G. Members shall reaffirm the representative and alternate appointed to the Network Advisory Committee at least every two years.

H. Members of the Network Advisory Committee shall be expected to meet at least three (3) times per year, with additional meetings as required. The Annual Meeting of the Network Advisory Committee will normally be held in September of each year. One third (1/3) of the membership of the Network Advisory Committee shall constitute a quorum.

SECTION 5 - EXECUTIVE COMMITTEE

A. Purpose and responsibilities:

To coordinate and govern the activities of the Network Advisory Committee;

To convene meetings and set agendas;

To organize and manage the ongoing functions of the Network Advisory Committee; and

To serve as the communication vehicle between the Network Advisory Committee, including its committees, and the Board of Library Commissioners.

B. Composition: The Executive Committee shall consist of nine (9) members selected from the full membership of the Network Advisory Committee. Membership of the Executive Committee shall consist of representatives from the following Network Advisory Committee membership categories (the numbers in parentheses refer to the membership categories as specified in Section 4A above):

1. one representative from professional organizations (8,9)
2. one representative of the Regional Administrators (6)
3. one representative of the Regional Automation Committee Chairs (7)
4. one representative of the dial-up members of a cluster (3)
5. one representative from individual libraries (2,12)
6. two representatives from non-automated consortia (11)

7. two representatives from automated networks (1,10)

Two representatives of the Board of Library Commissioners (5) shall attend and participate in meetings of the Executive Committee as non-voting ex officio members.

C. Terms shall be for two (2) years, running from October through September, in an annual rotation; with four (4) members selected in odd-numbered years and five (5) members selected in even-numbered years. The rotation established shall take into account geographic diversity and size and type of library.

D. Officers of the Executive Committee shall be elected annually from among its membership and shall consist of a Chair and a Vice-Chair. The Vice-Chair shall automatically succeed to the office of Chair. An MBLC staff member will serve as Secretary.

E. A quorum of the Executive Committee shall consist of five (5) of its members, excluding representatives of the Board of Library Commissioners. A simple majority of members present shall decide a vote.

F. The Executive Committee shall be expected to meet six (6) times per year, with additional meetings as required.

G. The Chair of the Executive Committee shall also serve as Chair of the full Network Advisory Committee.

SECTION 6 - AD HOC COMMITTEES

A. Ad hoc Committees may be appointed by the Executive Committee to serve from time to time as needed.

B. The Chair of an Ad hoc Committee shall be appointed by the Chair of the Network Advisory Committee with the approval of the Executive Committee.

SECTION 8 - CHANGES AND REVISIONS

Changes and revisions to the Operational Guidelines shall be proposed by the Executive Committee, approved by the Network Advisory Committee membership, and recommended to the Board of Library Commissioners for action.

16 December 1983
revised 6 February 1984
revised 28 February 1984
revised 1 March 1984
revised 7 March 1984
revised 26 March 1984
approved unanimously by voice vote (with friendly amendments) by the Network Advisory Committee 26 March 1984
Approved by the Board of Library Commissioners, May 3, 1984
revised 29 January 1987