

**RESOURCE SHARING AMONG
MICHIGAN'S PUBLICLY ASSISTED
UNIVERSITY LIBRARIES**

**Information Systems
Consultants, Inc.
January 18, 1991**

I. INTRODUCTION

Information Systems Consultants, Inc. (ISCI) was retained by the Michigan State Council of College and University Library Directors to study ways to increase resource sharing among the libraries. The Council consists of the deans and directors of the 15 publicly assisted, four-year universities in Michigan. The institutions are dispersed throughout the state and their libraries range in size from 142,000 to more than 5.7 million volumes. While there has been considerable interlibrary loan and some reciprocal borrowing among the libraries, they do not currently participate in any statewide agreement on resource sharing.

The goal of the project is to create a mechanism for the libraries to share their resources more effectively and efficiently than they do now. The objectives include developing a structured voluntary network, moving beyond sharing among academic libraries to all types of libraries, adherence to protocols which stress tapping of local resources first, having libraries determine their own criteria for providing service, developing cost effective means for defraying the increased cost of resource sharing, using information technologies effectively, and providing the opportunity for other cooperative programs.

The methodology consisted of the preparation and distribution of a survey form to each of the Libraries, a meeting with the Council to discuss the survey form and plans for the site visit, in-person interviews with thirteen library directors (plus telephone interviews with two more), a visit to the Library of Michigan, two focus group meetings each with interlibrary loan librarians and systems librarians, a wrap-up meeting with the Council to discuss tentative observations, submission of a draft report on November 16, 1990, and preparation of the Final Report reflecting comments received from the Council and individual deans and directors.

The remainder of this report consists of an overview of resource sharing (Section II), a discussion of the Michigan Scene (Section III), and the consultants' recommendations (Section IV).

Several appendices are also included as part of this report. Appendix A summarizes the interviews; Appendix B is the draft Michigan Interlibrary Loan Code; Appendix C is a detailed description of the Open Systems Interconnection (OSI) Reference Model; Appendix D is a description of NOTIS' linking product; and Appendix E comprises the interlibrary loan specifications the consultants recommend.

III. THE MICHIGAN SCENE

The publicly assisted universities of Michigan have extensive holdings. Print collections alone number more than 16.1 million volumes. The libraries subscribe to over 148,000 current serials. The breakdown by institution is as follows:

Library Holdings

e, a
ent),
hile
ion,
vely

Library	Volumes	# Titles	Ser Subs	
Central Michigan	827,697	680,000	5,001	0%
Eastern Michigan	756,890	474,710	4,254	1%
Ferris State	213,000	170,000	2,000	1%
Grand Valley State	385,816	N/A	2,000	1%
Lake Superior	124,732	124,732	900	1%
U of Michigan (Ann Arbor)	5,300,000	2,200,000	54,000	1%
U of Michigan-Dearborn	244,471	197,422	1,646	1%
U of Michigan-Flint	148,542	129,000	1,439	1%
Michigan State	3,461,355	N/A	28,910	1%
Michigan Technological	305,209	153,656	7,387	1%
Northern Michigan	470,010	N/A	2,818	1%
Oakland	358,000	N/A	2,400	1%
Saginaw Valley State	212,723	120,896	1,123	1%
Wayne State	2,400,000	1,500,000	24,588	1%
Western Michigan	1,009,290	533,316	10,163	1%
TOTALS	16,217,735	6,283,732	148,629	1%

0%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

1%

and,
ding

These figures do not include those of the Library of Michigan, with a total volume of 2,500,000, including 1,664,000 titles, and 2,200 serials subscriptions.

The libraries are all using a bibliographic utility. While two are RLIN participants, all have their records in the OCLC database. All except one have automated internal operations, with eleven of them using NOTIS, one Dynix, one Geac, and one PALS. Ten of the systems have gateways, but the rest would need to install the appropriate hardware and software to permit any terminal to go out through the CPU. All except one have dial-in capability for remote access. Only three have contractual commitments for OSI support; only two have contractual commitments for an interlibrary loan module.

Automation Activity

Library	Utility	System	Gate	Dial-in()	OSI	ILL
Central Michigan	OCLC	NOTIS	Yes	Yes	No	No
Eastern Michigan	OCLC	NOTIS	Yes	No	Yes	No
Ferris State	OCLC	PALS	Yes	Yes(3)	No	Yes
Grand Valley	OCLC	NOTIS	No	Yes (10)	Yes	No
Lake Superior	OCLC	None				
U of Michigan (Ann Arbor)	OCLC/RLIN	NOTIS	Yes	Yes	No	No
U of Michigan-Dearborn	OCLC	Geac. <i>switching?</i>	No	Yes (3)	No	No
U of Michigan-Flint	RLIN	None	Yes			
Michigan State	OCLC	NOTIS	Yes	Yes (40)	No	No
Michigan TechNological	OCLC	NOTIS	Yes	Yes (17)	No	No
Northern Michigan	OCLC	NOTIS	No	Yes (4)	No	No
Oakland*	OCLC	NOTIS	Yes	Yes	No	No
Saginaw Valley State	OCLC	Dynix	Yes	Yes (4)	Yes	Yes
Wayne State	OCLC	NOTIS	Yes	Yes (100)	No	No
Western Michigan	OCLC	NOTIS	No	Yes (16)	No	No

*shares WSU system.

() number of ports.

The Library of Michigan is an OCLC participant, uses NOTIS, has no gateway, offers 16 dial in ports, and has no OSI and ILL commitment from its vendor.

The consultants interviewed 65 librarians, including 19 deans and directors or representatives, 26 interlibrary loan librarians, and 20 systems analysts. The deans and directors were interviewed individually and the rest in focus groups of up to 16 persons each. The following conclusions were drawn from the interviews:

Field Observation

1. There are significant differences of opinion about which are the weak links in the ILL chain --
 - a. Interlibrary loan librarians emphasize the need to address fulfillment, document delivery, accounting, and compensation.
 - b. Systems librarians generally favor linking of systems, but only as part of a broader program.
 - c. Library directors are divided, but generally place a higher priority on linking than others.
2. There is general agreement that linking must be based on standards, and should link all systems regardless of vendors.
3. End user searching of linked systems is preferred, but with placement of ILL requests continuing to be handled by library staff.
4. There is preference for using MERIT as the telecommunications network.
5. There is general acceptance of the fact that the "transparent" interface will take two or more years to implement --
 - a. Vendor products are preferred over custom development.
 - b. Vendor contracts lack requirements for OSI conformity and ILL modules.
 - c. The interface should include the ability to access OCLC without rekeying.
6. There is some interest in approaching linking in stages with dedicated terminals to other systems the first choice.
7. There is general agreement that interlibrary loan will be more important than reciprocal borrowing, but that reciprocal borrowing is easier to absorb without staff increases.
8. There is concern among interlibrary loan librarians that linking may increase ILL demand, and that there will be no staff increases to handle the load.

IV. RECOMMENDATIONS

Based on their analysis of the data, the consultants have developed the following recommendations.

1. Implement a broad program of resource sharing, one with several components, with libraries to have the option of participating in any combination of activities.

While there appears to be consensus among the deans and directors of Michigan's publicly assisted universities that resource sharing should be strengthened--a view shared by interlibrary loan and systems librarians--there is no consensus as to how that should be done. A significant minority of deans and directors favor linking of the local library systems, but many library directors and almost all of the interlibrary loan librarians feel that the improvement of fulfillment, document delivery, accounting, and compensation are much more important. While these differing approaches might compete for attention and resources, they need not be mutually exclusive. The solution appears to be a multi-part program that allows for local option with regard to participation among linking, delivery, simplified accounting, and other components. However, while there may be no minimum level of participation required to realize improvements in several areas, some activities--especially document delivery--are highly dependent on high volume to be financially viable.

The consultants have developed several additional recommendations which they urge be considered as a single program, with individual institutions declining participation in specific components only if they feel that a component which is of general benefit imposes too great a burden on its institution.

2. Formally adopt the National and Michigan Interlibrary Loan Codes, with a clarification as to the interpretation of "regions."

The consultants wish to underscore that all of their recommendations assume that the libraries will continue to adhere to the underlying principles reflected in the current National Interlibrary Loan Code: the thorough use of local resources; the meticulous screening of requests before resorting to interlibrary loan; and looking to the genuine research need of the borrower, rather than his/her status, to determine whether an interlibrary loan request is undertaken.

The consultants recommend that the Council formally adopt the National Interlibrary Loan Code. They also recommend that the Council adopt the Michigan Interlibrary Loan Code when it is officially published. The formal adoption of these Codes is valuable guidance for interlibrary loan librarians, both within and without the publicly assisted university libraries.

The Council should in its adoption of the Michigan Interlibrary Loan Code add a clarification which states that for the publicly assisted university libraries the "region" appropriately is defined as the entire state. Thus, the publicly assisted university libraries may turn directly to any similar library within the state, but will seek to meet their needs within the state before looking outside the state. The reason for the clarification is that the publicly assisted institutions have the most comprehensive resources within their regions, therefore, there would be needless delay if the regional level were interpreted as anything less than statewide. Other types of libraries would be expected to adhere to Michigan's definition of Regions of Cooperation. This would effectively filter the requests from other libraries before they come to the publicly assisted universities.

The new Michigan ILL Code, still in draft form, is consistent with the National ILL Code and with the needs of major academic libraries. The new Michigan ILL Code places no restrictions on the types of materials that may be requested, or for whom, but lending libraries can establish restrictions. Interlibrary loan is clearly identified as an adjunct to, not a substitute for, collection development. It also stresses satisfying needs within a region (the one area in which it is insensitive to the needs of major academic libraries) before going to the state level, and going to out-of-state libraries only when resources within the state are exhausted. According to members of the task force which developed the draft, the regional emphasis is not intended to apply to major academic libraries, but the Code is not clear on that point. According to the draft, libraries should attempt to spread requests to avoid one library receiving a disproportionately large number of requests. Materials are to be described completely and accurately. When items cannot be verified they shall be labeled "cannot verify." The borrowing library is responsible for compliance with the copyright law (Title 17, U.S. Code) and its accompanying guidelines, and shall inform its users of such requirements. Electronic transmission of requests shall be considered the preferred means of transmitting requests. The safety of borrowed materials is the responsibility of the requesting library. The conditions of the loan, including loan periods and charges, are to be set by the lender, but they must be made known beforehand. Borrowers shall authorize the fee on the initial request or, if no fee is acceptable, enter OS. Participants in OCLC Group Access (GAC) should publish and maintain their policies in the OCLC Name and Address Directory. The lending library should notify the borrowing library promptly when unable to fill a request, and should process the request promptly. The draft Michigan ILL Code is included as Appendix B of this report.

The consultants recommend that the Council go beyond the ILL Codes as appropriate, augmenting or making exceptions to them to improve cooperation among the publicly assisted universities and to improve their relationship with other types of libraries in the state. Among the programs that can be built on the foundation provided by the Codes are performance objectives, delivery service, telefacsimile networks, and--at a later time when effective resource sharing has been achieved--possible cooperative collection development efforts.

3. Move toward the adoption of performance objectives, with a one week "satisfaction time" the first objective.

The consultants strongly recommend that Council seek to establish performance objectives for interlibrary loans among the publicly assisted universities, and such other major libraries as they may seek to include in their agreement. It is only by setting measurable goals that it will be possible to achieve improvements which have been discussed for years, but which have not yet been realized.

Anecdotal evidence suggests that fulfillment time among the libraries varies widely and is a major factor in "satisfaction time," the time from the receipt of a request from a patron until the time the material is available for use, remaining at an average of two weeks despite the introduction of electronic locating and requesting tools in the past decade. The consultants recommend that the Council augment the adoption of the National and Michigan Interlibrary Loan Codes by adopting specific performance objectives, the first of which should be to reduce satisfaction time, to one week.

Among the sub-objectives should be the one of confirming or fulfilling a request from another publicly assisted university library within two working days. When combined with the linking of systems and a delivery program (see recommendations 4 and 8), it would become possible to achieve one week satisfaction time for most interlibrary loans during all except the semi-annual peak load periods.

In most cases the improvement of fulfillment time will require the addition of .5 to 1.5 FTE to the interlibrary loan staff of a library. For some, it may require changes in internal procedures. For example, each main library should receive U.S. mail and overnight courier services shipments directly. Also, rather than receiving all interlibrary loans centrally, sorting them, and distributing requests for materials in other campus libraries by campus mail, the requests should be searched on the local library system at the point of initial receipt, and those for other campus libraries sent as an electronic mail message to the appropriate campus library.

BY FAX?
(with re - time)

4. Link the local library systems of the state's major libraries using vendor products which conform to OSI protocols, including NOTIS and PACLink.

The consultants recommend linking the local library systems of the state's major libraries as another step in reducing satisfaction time. The linkages should include not only publicly supported universities, but others such as Detroit Public, Library of Michigan, and strong clusters of public libraries such as those in Grand Rapids.

Despite the generally high level of satisfaction with the OCLC and RLIN interlibrary loan subsystems, neither offers availability information. While it is possible to determine that a title is held, it cannot be determined whether a copy can be supplied or whether all copies are unavailable because they are in circulation, non-circulating, on

reserve, at the bindery, or missing. The wait for confirmation of availability is one of the obstacles to improving satisfaction time.

The linking of local library systems would provide availability or status information as part of a single session for locating, confirming, and requesting. Presumably this could reduce the satisfaction time by four days or more since it now requires requesting a title an average of 1.6 times in order to obtain it.

The linking of local library systems potentially is even more significant as a public service. Patrons will be able to determine the holdings and availability of materials in libraries other than their own. They, therefore, could approach interlibrary loan with greater expectations, and would have the option of exercising reciprocal borrowing privileges at a library nearby, or convenient to home, that has the material available.

The consultants strongly advise against the development of ad hoc interfaces--individual interfaces from one vendor's system to another. Even though the majority of libraries have systems from a single vendor, NOTIS, the linking of these NOTIS systems to as few as three other vendors' systems would cost at least \$800,000 in custom software development over a five year period. This estimate is based on quotations for custom interfaces by CLSI, DRA, Dynix, and Geac. The minimum cost of writing a single interface is \$60,000. Well over half of the cost would be for rewriting the interface periodically as the linked systems continue to be enhanced over five years.

The consultants also advise against using third-party products of vendors such as Minicomputer Systems Incorporated (the vendor with the product based on the Irving Library Consortium's development work) because none of the products is in full conformity with the Open Systems Interconnection (OSI) Reference Model, none is supported by local library system vendors, and none comes from companies with sufficient human and financial resources to assure their long-term viability.

The consultants recommend that the linkages be based on standards developed by the National Information Standards Organization (NISO) using the OSI Reference Model. Not only will that make it possible to link all of the university library systems, regardless of vendor, but it also will facilitate linking with the systems of public and other types of libraries. In fact, the OSI standards also will facilitate linking with out-of-state systems and non-library systems. There would no need to rewrite the interface because each vendor would make standards conformity an integral part of its product enhancement program.

The most important of the NISO standards are the record transfer, common command language, and interlibrary loan standards. All of these will be published by the end of 1990. Linkages based on these standards will be "transparent" to the users, thus requiring no special training for them to search systems other than their own. This would make it possible for the libraries to permit searching by faculty and students, as well as staff. The fourth important standard, dealing with patron records, is out for balloting.

It is crucial to reciprocal borrowing, rather than to interlibrary loan. Appendix C consists of a detailed discussion of the OSI Reference Model.

Every major vendor (CLSI, DRA, Dynix, Geac, INLEX, Innovative Interfaces, NOTIS, and UNISYS) has made contractual commitments to a number of customers to support the linking of systems using the standards developed under the OSI Reference Model. In most cases the commitment is for conformity within two years of publication of a standard. The majority of vendors have committed to include the cost of OSI conformity within their enhancement program, thus requiring no additional software charges for customers that wish to implement linkages. However, all of the vendors project some hardware costs. At a minimum these would include a gateway out of the system (including one or more dial-out modems) and dial-in modems for access from other systems. Interconnection with networks would be more expensive. A few vendors are considering mounting the linking capability on a microcomputer between their system and the telecommunications circuit. In a number of contracts, vendors have been willing to cap the projected cost at \$10,000 for connections using telco circuits and \$25,000 using value added networks (MERIT would be considered a value added network). UNISYS may require some additional system software and hardware to effect a connection to a value added network. ISCI will provide the information as soon as it is received.

NOTIS, which has done more development work than any other vendor, is the exception to the industry pricing pattern. It has projected prices as high as \$60,000 per system linked. There is not much point to pressing for a break-out of software charges because none of the Michigan institutions has a contractual commitment for OSI support. NOTIS has emphasized that it wishes to sell linkages to consortia, rather than to individual institutions. On that basis the vendor might be prepared to link all of the NOTIS systems in Michigan to one another and to other systems which support the OSI protocols. NOTIS has quoted \$500,000 for linking all of the NOTIS systems in Michigan, and linking the NOTIS systems with the systems of other vendors which conform to the OSI standards. The "PACLink software would include the ability to produce an ILL request, but not the an interlibrary loan module. The link would be a general release product, as fully supported as any module of the applications software. Since the oral quotation is not binding, it is important that the libraries seek a formal written quotation from NOTIS.

Neither NOTIS, nor any of the other major vendors, will offer OSI conformity until the second half of 1992. The preliminary description of NOTIS' linking product, known as PACLink, is included as Appendix D.

The consultants recommend that the Council seek a grant of at least \$600,000 (the estimated combined cost of the NOTIS, PALS, Dynix, and Geac linking products if a VAN, such as MERIT, is used as the telecommunications provider) to fund a linking of all of the systems. A budget of \$600,000 would cover all hardware, software, and installation expenses for the local library system vendors, but would not include local labor and charges levied by the telecommunications carrier.

Among the funding sources that should be considered are the Carnegie, Kellogg, Kresge, Mellon, and Pew Foundations. The National Science Foundation also offers grants for networking projects. The consultants suggest that a grant application describe the total resource sharing program, rather than just the component for which funding is being sought. Not only will that make the uniqueness and scope of the program clear, but it will assure the funding source that its grant alone is not expected to accomplish a major improvement in resource sharing.

Should none of these funding sources be able to provide all of the money needed, the cost of the unfunded portion could be raised either from an HEA Title II-C grant (although the next cycle is nearly a year away) or by assessing the libraries wishing to implement linkages in proportion to their in-state interlibrary loan activity, rather than having each participant pay an equal share.

5. Facilitate near-term access to other libraries' systems until OSI-based linkages are implemented.

While several libraries already encourage searching of other libraries' systems by offering a menu of options on their campus network or installing a terminal dedicated to access to another library's system, there is no Council agreement to that effect. The consultants recommend that the Council agree that each institution implement one or the other approach, with a minimum of three other libraries' systems to be available in each library. This figure is based on anecdotal evidence that as much as half of most libraries' interlibrary loan borrowing could be satisfied from as few as three libraries.

Each library should clearly label its network menus or dedicated terminals so that patrons will know what libraries can be accessed and how. If a library's system or network can provide statistical data on usage, it should be compiled to facilitate planning for the OSI-based linkage and project staff requirements for possible increases in interlibrary loan and reciprocal borrowing.

The interim connection could be through MERIT or by dial-up. The former is recommended for those who already have MERIT access.

The consultants advise against implementing the linkages before the telecommunications network selected can support an implementation under OSI. While an interim implementation would be possible in early 1992 using TCP/IP protocols, it would require additional outlay and a migration to another protocol within a short time.

6. Use the MERIT telecommunications network as the primary means of linking systems.

The consultants recommend that MERIT be the primary telecommunications network for the linking of the systems. Not only is MERIT the most widely deployed value added network available in the state, but it is likely to continue to be for the next several years. The more comprehensive statewide network proposed by the Governor's Telecommunications Task Force is unlikely to be funded. MERIT also has the advantage of being interfaced with INTERNET, the national network interconnection. Finally, MERIT is committed to migrating from TCP/IP, its present protocol, to OSI. While no firm date has been set, it is expected to occur within the same 18 to 24 month time frame as will be required for the completion of standards development.

If this recommendation is accepted, the Council should seek representation in the MERIT User's Group and on committees. The rationale should be that collectively the Libraries represent a type of user different from either academic or administrative computer users, and the level of their usage warrants representation in policy formulation.

While only ten of the universities are MERIT members (including two of them that have their membership through another campus), it is not necessary for a library's parent institution to participate in order for the library to use the MERIT network. Affiliate membership status does not require the payment of the \$100,000 entry fee. While some form of membership is required for any permanent connection, membership is not required for dial-up access.

MERIT has confirmed in writing that a library can become an "affiliate member" on its own. The annual membership fee for an affiliate is based on its annual budget or staff size. The minimum fee is \$4,000 per year for an organization with a budget of less than \$5 million or a staff of fewer than 50 seeking a 9,600 bps connection. While this is only \$1,000 a year less than a small campus might pay, it does make it possible for a library to act if there is inaction on the part of the campus. As of late 1990, MERIT was in discussions with three campuses: Ferris State, Grand Valley, and Saginaw Valley.

There are charges in addition to the annual membership fee: the cost of any new equipment required at both ends of the connection, telephone company installation fees, and ongoing charges for the leased line used to connect to the Network's backbone. Without detailed analysis it is not possible to quote firm prices, but MERIT has estimated that the all-inclusive cost of a direct IP connection would be \$20,500 for the first year and \$8,300 per year thereafter per institution. This cost could be reduced by making a direct X.25 connection, although that would involve more investment in equipment. The estimate for this option is \$12,500 for the first year, and \$7,800 per year thereafter. None of the costs include repairs in case of failure of network equipment at member sites. Jeff Ogden, Manager of Recruitment and Support at MERIT is the appropriate contact person for more information.

Only direct connection--a type of connection only available to MERIT members--will make it possible for a library's system to be accessed from the network because there are virtually no dial-out modems, however, terminals on a library's system can dial into a MERIT network node through a gateway in the CPU without holding membership in MERIT. At the present time there are no charges for this service, although a library may incur long distance tolls. A library could spend up to three hours a day online without incurring charges which exceed the cost of a leased line to the backbone.

A library expecting to search more than three hours a day, but with most of that searching against the databases of a limited number of institutions less than 50 miles away, could implement a leased circuit to the primary resource sharing partner(s). The leased circuits would allow for permanent two-way connectivity, whereas the dial-up access to MERIT would provide only searching of a remote database on MERIT. When negotiated directly with the telco, the current cost is \$10 per mile per month, although this is expected to drop by at least 40 percent in the next few weeks.

7. Support a combination of linking and OCLC GAC to facilitate access from other types of libraries.

The publicly assisted university libraries should be prepared to extend linking to the system of the Library of Michigan and to the systems of privately supported universities, major public libraries (especially Detroit Public), and consortia interested in linking and prepared to upgrade their systems to support the OSI protocols. The linkage with the Library of Michigan and Detroit Public could occur as part of the initial linking effort, but other linkages should be delayed at least one year to give the libraries time to refine their policies and procedures.

The Council should support the OCLC GAC program for access to the resources of the publicly supported universities by libraries which do not have systems capable of linking.

Libraries which have a linked system or OCLC GAC available to them should be advised to avoid mail, electronic mail, fax, and other forms of requests. This should result in virtually all requests coming in one of two electronic forms; electronic mail over linked systems or OCLC.

8. Seek to implement a statewide delivery service on the Pennsylvania model.

A majority of the interviewees stressed the importance of "physical access," not just "electronic access." Inasmuch as delivery is believed to be one of the weakest elements of the current interlibrary loan system in Michigan, as it is in most other states, the libraries should seek to implement a statewide delivery service. Ideally such a service would involve all types of libraries as well as financial participation by the Library of

Michigan. The consultants recommend the Pennsylvania model because it has achieved the lowest per-item cost.

The Interlibrary Loan Delivery Service of Pennsylvania (IDS) is a cooperative association of academic, public, special, and school libraries throughout the Commonwealth of Pennsylvania organized for the purpose of providing "delivery of interlibrary loan and educational items" among its members. IDS traces its beginnings to 1969 when the Area College Libraries of Central Pennsylvania received an LSCA Grant which, combined with their own membership fees, enabled them to develop a delivery service for interlibrary loan that extended from Central Pennsylvania to Philadelphia and included 35 members, among which were six district library centers and the Pennsylvania State University. Its membership increased to 67 members in 1973. Then in 1975 an LSCA Grant enabled the membership to reach 156 members as it extended its service across the state. During this period of time the number of items moved through the system expanded from 27,000 items in 1970 to 250,000 items in 1976.

From 1975 to 1979 IDS operated its own fleet of rental trucks throughout the state. At that time increased costs for fuel, repairs, and labor necessitated a review of IDS procedures. After consulting with a transportation expert, IDS acted to contract its delivery services. Its new mode of operation began in 1980. In that year IDS transported more than 160,000 items for more than 110 members whose locations span the state. IDS provides pick-up and delivery services on a three days per week schedule. In 1980 the annual budget was over \$200,000, with nearly \$60,000 coming from LSCA funds. Membership payments by participants constituted almost all of the other revenue.

The charging mechanism favors libraries with high volumes, with infrequent users paying almost three times as much for an item as high volume users. Specifically in 1989 a library with fewer than 500 transactions a year paid \$650, one with 501 to 1,000 paid \$975, one with 1,001 to 2,000 paid \$1,300, one with 2,001 to 3,000 paid \$1,625, and one with 3,001 to 4,000 paid \$1,950. More than 271,000 packages were moved in 1989 among 140 participants (20 of them clusters of libraries). The average cost, including the State Library subsidy, was \$1.75 (up 15 percent from the year before because of a restructuring of UPS pricing). The cost per item moved was actually somewhat less because libraries usually include several items for the same destination in a single package. The total 1989 budget was just over \$506,000, of which the State Library contributed a total of \$340,000. A major expansion of the program is now underway, with a total of 640 participating libraries anticipated by the end of 1990. The average cost will rise to \$1.85 because the majority of the new participants will have very low transaction volumes.

While the Pennsylvania program levies the charges on the shipping libraries, the consultants recommend that the charges be paid by the receiving libraries. This not only places the financial burden where it belongs, but also gives greater control over cost to the requesting institution.

One Pennsylvania library compared the costs of delivery using IDS against the other options. They took into consideration not only the amount paid out, but also staff time and materials. This is important because IDS materials to a specific location more often than mail are packaged together to save time and supplies, and to reduce UPS charges. One adjustment needs to be made in the figure for IDS, however, the inclusion of the per item subsidy provided by the State Library (\$.33 at the time of the study). After making that adjustment, the comparative costs were estimated as follows:

IDS (UPS blanket contract)	\$1.42
U.S. Mail (first class)	3.73
Regular UPS	8.24

IDS has achieved a consistent one to two day delivery time anywhere in the state. Anecdotal evidence suggests that even first class mail service takes two to four days, and even regular UPS service consistently is more than two days.

The consultants recommend that an effort be made to obtain a \$50,000 seed grant to "buy down" the cost of the program in the first year to an estimated \$1.50 per item received. Among the funding sources which might be approached are the Kellogg, Carnegie, Kresge, Mellon, and Pew Foundations. As the scale of the program grows beyond an initial level of fewer than 100,000 items a year, it will be easier to predict and control costs. If the delivery system includes multi-type libraries, it may be possible to obtain ongoing funding through the Library of Michigan much like the ongoing funding in Pennsylvania. While most of Michigan's Title III grant funds, a total of approximately \$646,000 a year, have been devoted to OCLC GAC projects, a wider range of projects are expected to be possible in the future, especially those which support multi-type groupings of libraries. Delivery is specifically mentioned as one of the areas of funding for the Title III program.

The Council should not hesitate to undertake a statewide delivery program because of uncertainty about future participation by other libraries or support by the Library of Michigan because U.P.S. can be cost effective even on a small scale. The delivery service of Network of Alabama Academic Libraries (NAAL) moved over 11,000 items in the past year among its 19 academic and two special libraries using U.P.S. While there is no data for the exact number of items moved, the total costs were \$29,000 based on quoted prices of \$5.00 per week per pick-up point, plus an average of \$2.26 per item (assuming the average item is between one and two pounds and moves two zones within the state).

The consultants specifically advise against the Connecticut model, that of purchasing vehicles and hiring drivers. Not only does it result in considerable overhead, but it is difficult to adjust to seasonal fluctuations in usage. The average cost per item moved in Connecticut exceeds \$2.50.

The consultants also advise against the Maryland model, that of linking regional delivery services. None of the services has sufficient volume to achieve a cost of under

\$2.50 per item, and items are held an average of two days at the Enoch Pratt Library awaiting transfer to another region's van--an average affected not only by the fact that some services operate only three days a week, but also by the fact that coordinating pick-ups and deliveries for five separately administered services is extremely difficult.

Illinois has been more successful with the linking of regional delivery services. The State Library spends \$346,000 a year to link the six delivery services. Only interregional deliveries are supported; each region is responsible for movement within its region. While the delivery services exchange daily, only 40 institutions have daily pick-up and delivery within their regions. The result is that major libraries achieve 48 hour delivery, but other libraries typically achieve 72 hours. The average cost per item moved is believed to be \$2.30, but a study of the network has just been launched to verify costs and to determine how it might be improved. If the Council wishes to pursue the regional approach, rather than the statewide approach recommended by the consultants, it should study the report which Illinois hopes to have completed in Fall 1991.

9. Commit to continued use of telefacsimile for the transmission of copies of journal articles.

Telefacsimile has been available for some years and has been the subject of experimental trials in libraries since the mid-1960s. Developments in telefacsimile in the past five years have improved the quality and resolution of the images transmitted while substantially increasing the speed of transmission, thus reducing the impact of telecommunication charges for document delivery. Improvements in the technology have also removed most of the inconveniences inherent in the older machines, resulting in equipment that is compact, easy to use, and mechanically reliable.

As detailed in a study of the application of telefacsimile technology in libraries by McQueen and Boss¹--the economic application of the technology depends upon its use in situations in which the volume of material transmitted is high enough to permit the amortization of equipment charges over a sufficient number of page transmissions per month to result in an acceptable cost per page transmitted. Given the current state of the technology and related factors such as telecommunications charges, an acceptable cost appears likely to be achieved only under one of the following conditions:

- (1) very high transaction volumes among points in telefacsimile networks--volumes of at least 500 pages per month and preferably 1,000 pages per month at each site;

¹ McQueen, Judy and Richard W. Boss. "High-Speed Telefacsimile in Libraries," Library Technology Reports, 1983, vol. 19, no. 1, pp. 7-111.

- (2) incorporation of the telefacsimile technology into the work patterns of the interlibrary loan staff rather than treating telefacsimile as an exception to regular routines. This involves not only batching the photocopying of such materials, but also batching multiple transmissions to a single site, and use of lower-rate evening hour telecommunications rates using a staff member who is regularly scheduled to arrive before 8:00 a.m. or leave after 5:00 p.m.

10. Implement semi-annual reconciliation of charges among the publicly assisted university libraries.

The libraries should seek to move away from preparing small invoices for photocopies and other interlibrary loan services, especially among themselves. It is time consuming and fails to recover all of the costs incurred. Now that all of the libraries have, or shortly will have, implemented local library systems, the Council should reach agreement that each will use the statistical capabilities of the systems (augmented with additional data kept on a PC as necessary) to calculate the obligations of other institutions to them. Once each six months an invoice would be prepared and sent to each of the other institutions owing money.

At such point as the systems are linked and appropriate software is available as part of the interlibrary loan modules, the statistics could be used to calculate the differences between that "due" and "owed," and a check for the difference issued by each institution which had a negative balance vis a vis another institution.

11. Implement the interlibrary loan module of the local library systems as they become available.

Most major vendors plan to introduce interlibrary loan modules in late 1991 or 1992. Not only will these modules act as a "front-end" to facilitate interlibrary loan among linked systems, but they will pass searches against the OCLC database should a request not be satisfied among the linked systems. Further, an interlibrary loan module keeps track of copyright compliance and the "balance of trade" among institutions. By using these capabilities it would be possible to tabulate statistical data once or twice a year to determine how much is owed or owing in any bilateral interlibrary loan relationship.

NOTIS had placed a low priority on the development of an interlibrary loan module because its user group has not given this capability a high priority in balloting for enhancements. However, NOTIS has contracted with Indiana's Higher Education Commission to develop such a module. It is expected to be completed in mid-1992. It will substantially conform to the requirements set forth in Appendix E of this report.

NOTIS has quoted a fee of \$280,000 to supply the module to each of the NOTIS users in Michigan. The Council should seek a binding written quotation.

Should no NOTIS ILL module be forthcoming by late 1992, the libraries using that system may wish to adapt and implement the Consortium Loan System developed by a group of Washington, D.C. area institutions. The Consortium Loan System (CLS) is an interlibrary loan module that allows the individual library user to enter a request at the OPAC station and then enables the interlibrary loan staff to transmit these requests electronically. The software is still being developed and is in test among libraries of the Washington Research Library Consortium (WRLC), a group of eight university libraries in the Washington, D.C. metropolitan area. The project was funded under the College Library Technology and Cooperation Grants Program (HEA Title II-D). At the present time, two universities are actively sending interlibrary loan requests via CLS, and the others are responding via CLS. In November 1990, the test process expanded and all libraries began using CLS for lending and borrowing.

12. The Council should facilitate reciprocal borrowing by pursuing a statewide academic library card for faculty and doctoral candidates.

The consultants strongly recommend that reciprocal borrowing be considered as an important adjunct to interlibrary loan. What limited statistical data is available (primarily that from Indiana's "cluster systems") documents much more frequent movement of patrons than materials. When faced with the choice of driving to another institution where the material is known to be available or waiting one to two weeks, Indiana's faculty and students get in the car five times as often as they seek interlibrary loans.

While it may be impractical for the academic libraries to participate in the Library of Michigan's MICHICARD program, or offer to extend borrowing privileges to all faculty and students in institutions of higher education, it would be possible to attach a validating sticker to the cards of faculty and doctoral candidates in the publicly assisted universities. Since virtually all of the institutions have local library systems capable of limiting the number of loans outstanding to a patron at any one time, a limit of ten titles could be set to avoid a researcher stripping an institution of resources needed for its own clientele. Given the circulation levels of most of the libraries, the impact of reciprocal borrowers on circulation staff should not be significant. True "reciprocity" or "balance of trade" should not be an issue unless the number of loans by faculty and graduate students from other institutions exceeds three percent of a library's annual circulation. That has been an uncommon occurrence in other states.

The consultants recommend that the institution at which an individual is employed or registered for graduate work assume liability for failure of a patron to return materials. They would signal their willingness by applying the sticker to the patron's identification card. The sticker would be valid for six months, thus allowing an institution to limit long-term abuse of the program.

Another option to limit the scope and impact of the program would be to limit the total number of stickers available to a percentage of each institution's graduate enrollment. That might be a local option.

At such time as the patron record standard now being developed by NISO is published--probably in 1992--it would be possible to use the sticker to signify the consent of the borrower to have his/her patron records transferred among library systems. The library at which the card were presented could access the database of the patron's home institution to check for current delinquencies and to download the record for addition to its patron files.