Introduction

This report provides recommendations related to materials handling and collection management at Multnomah County Library (MCL). The recommendations are based on the findings reported in the Appendix.

Lori Bowen Ayre, Principal Consultant at The Galecia Group, was hired by Multnomah County Library to address several pain points related to materials handling and the Library collection. Specifically, the Library stated the following:

- MCL has many small neighborhood library buildings with workrooms too small for the growing materials handling operation.
- Having completed a major system-wide renovation and building project in 2004, expansion of the existing buildings is not a viable option. Even if funding were available, building larger buildings in the urban environment is difficult to impossible.
- MCL does not have the physical capacity to house and service the collection it can afford to provide and the public demands.
- Aggressive weeding undermines collection richness and balance. It also limits the scope of materials found in branch libraries.
- MCL has experienced a shift of public use from the large Central Library where 42% of the collection is housed to the 16 (soon to be 18) neighborhood libraries.
- Patrons rely heavily on the holds and reserve system to get materials they can't find at their local libraries; this is beginning to stress the materials movement system to the breaking point.
- The centralized Sort Center in the Library Administration Building is undersized to deal with the increasing volume of materials.
- MCL is experiencing an increase in worker's compensation claims related to manual materials handling workload.
- MCL needs additional office space for administrative, support and outreach staff.

In order to evaluate the situation and provide recommendations for addressing the pain points, Consultant spent several days visiting each of the libraries, talking with neighborhood and regional library staff, meeting with delivery staff, technical services staff, systems staff, and administration, and conducting focus groups with branch library workers. In addition, numerous documents, manual, spreadsheets, power point

slides have been provided by the Library and these have all been reviewed by Consultant. The findings are found in the Appendix.

This report provides a discussion of the critical factors contributing to the current materials handling and collection management issues. Trends in public libraries are also brought into the discussion.

Based on the findings, critical factors and trends, a set of recommendations is provided.

Critical Factors

MCL is a very popular library system. In 2007, almost 20 million items were circulated, and 2 million holds were filled. There were 4.6 million visits to the library and 315,000 people attended library programs. MCL is responsive to the communities it serves and strives to offer services customers need and want, including increasing the number of bilingual/bicultural staff by 327% since 2004. As a result, more and more people are finding reasons to use MCL libraries. Two new libraries are in the planning stages.

Many people use the physical space of the libraries to browse, use public computers, participate in programs, and to get help from the staff. Many people also use the resources of the library but not the physical space. These people do their browsing online, request material for pick-up, and use other online resources. The library works hard to provide exceptional service to a diverse and growing community of both online and in-library users.

By every standard of measure, MCL is very successful. Compared to peer libraries (including Columbus Metropolitan Library, Cuyahoga County Public Library, and Hennepin County Library), MCL circulates more items per capita than the others and circulates twice as many per hour (or more) than any of the others.

Table 1: MCL Success (based on circulation)

	Circulation	Population	Circ/Capita[13]	Circ/Hour
Multnomah County	19,589,530	692,823	28.3	21,270
Columbus Metro	16,489,899	833,082	19.8	10,993
Cuyahoga County	15,945,104	629,334	25.3	8,814
Hennepin County	13,030,711	761,637	17.1	10,458
Denver Public	9,244,353	575,927	16.1	10,565

Success has not come without its challenges. MCL must find solutions to the problem of too little space for collections, customers, and personnel without sacrificing services. There are many possible approaches to the problem but all involve a trade-off. In order to lay the foundation for the recommendations provided in this report, several factors are highlighted because they play a critical role in creating the current situation and limiting the options available to MCL.

[13] Public Library Data Service Statistical Report. (2007). Prepared by the Public Library Association, a division of the American Library Association. Chicago, Illinois.

MCL library buildings are very small for the use they receive

Each of the MCL libraries is bright and welcoming. The comfortable public spaces are largely a result of a 1996 bond measure which provided $24 million for renovations, new construction and technology of the public areas. The renovations added 28,198 square feet to library branches. The 1996 bond measure followed a project that added 18,150 square feet to the Midland Branch and completely renovated, but did not expand, the Central Library.

Despite these renovations and additions to library buildings, MCL still has significantly less square footage per capita than other comparable libraries. At .38 sq. ft. per capita, MCL has only 25% to 50% as much square footage as comparable public libraries like Denver Public Library, San Jose Public Library, Cuyahoga County Library or Hennepin County Library. The two new branches set to open in the next year will both be small facilities of about 6,000 sq. ft. each.

Table 2: Square Footage of Comparable Libraries[14]

	Square Feet	Population	Square Foot per Capita
Multnomah County	265,762	692,823	0.38
Columbus Metro	551,447	833,082	0.66
Cuyahoga County	623,530	629,334	0.99
Hennepin County	464,512	761,637	0.61
Denver Public	775,739	575,927	1.35

MCL's appealing, renovated public spaces, and popular services have brought in more customers and made the libraries more popular than ever. As a result, MCL has higher use per capita, but less square footage per capita than any of its peer libraries.

It is unlikely that MCL will be able to double or triple the size of its footprint by enlarging or increasing branches in the near future because of construction costs, on-going operating costs and the difficulty of siting large buildings in an urban setting. That being the case, MCL must rethink the way it uses its public spaces and manage its ever-increasing materials handling workloads so that its libraries can continue to meet community needs despite their small size.

[14] Public Library Data Service Statistical Report. (2007). Prepared by the Public Library Association, a division of the American Library Association. Chicago, Illinois.

Use of self-service holds system has skyrocketed

One of the very popular services provided by MCL is self-service holds pick-up at the customer's preferred location. Debuting in 1989, Multnomah County was one of the earlier library systems to allow customers to request material from another library to be delivered to their local library. Self-service holds were offered as a way to extend the rich MCL library collection to all customers regardless of the size of their home library. While it has always been possible to request material from another library by requesting a title from a staff person who then made arrangements on behalf of the customer, the transition to self-service hold requests from other library branches made the entire collection more available to all customers. Customers appreciated the ability to have their material waiting for them to pick-up regardless of where it had originally been shelved.

Between 2003 and 2006, public libraries everywhere experimented with ways to integrate self service holds pickup with their other service offerings. The service was so popular everywhere that it required libraries to adjust workflows and use of library spaces. Special holds shelves were designated so that customers could pick up their own items, but this cut into shelving previously used for browsing. Interlibrary delivery services were ramped up to accommodate the demand. MCL, like other libraries nationwide, struggled to make difficult choices between limited resources such as shelving space for material and the staffing required to support the new materials handling requirements related to holds. In 2000, MCL introduced self-service pick-up shelves (holds were no longer stored behind the circulation desk) so that the entire transaction (except possibly the check-out process) was self-service.

Nationwide, the popularity of the self service holds continues to grow. At MCL, 1,488,935 holds were placed between January and June, 2008. This is a 9% increase from the previous year. Related to holds increases are circulation and first time check-out increases. Since 1999, circulation has increased by 112%. In July, 2007, first time check-outs hit 700,872 (an increase of 10% over the previous year).

The space and staffing requirements associated with self-service holds continue to be a significant factor at MCL libraries.

Self-service check-out systems out of date at MCL

Self check-out machines for libraries were first introduced in the late 1990's by 3M. MCL bought these first generation machines and they were installed in Midland in 1996 and Central in 1997. As the branches were renovated, the 3M machines were installed in the libraries large enough to accommodate them. Due to space constraints, no self check-out machines were installed in Albina, Fairview, Gregory Heights, North Portland, Rockwood, or St. Johns.

Since these first installations, MCL has not added additional self check-out machines, upgraded their existing ones, nor promoted the use of self check-out in any formal way. In fact, use of self check-out technology has been undermined by the policy of keeping some material behind the circulation desk (for security purposes).

Many other libraries have moved beyond the original 3M self check-out machines with new 3M models such as the V-Series or have purchased self check-out machines from other vendors.[15] In addition, many libraries are now adding self check-in systems and providing more self-service options for fines and fees payment (e.g. stand alone kiosks paying fines and fees, or self check-out machines that allow for fines and fees payment).

Although MCL has been a library leader in many ways, the adoption of self-service technology and self check-out in particular, is out of step with current trends.

Staff work spaces are too small to accommodate current service demands

While the renovations provided much needed improvements, increasing demand for services has outstripped branch capacity to handle today's workload. Most of the MCL's workrooms are too small for the number of people who need to work in them and the amount of material that must be handled. Some lack offices for library managers. Library staff routinely share workstations.

One of the factors contributing to the lack of workspace is the high volume of delivery crates that require processing. Data from the Sort Center shows that in the first quarter of 2004, 13,912 delivery crates were sent to branches for processing. By the third quarter of 2008, that number had grown to 21,947, an increase of 58%. Increased borrowing and use of the hold system by library patrons is a major factor in this delivery increase. From FY04 to FY08, check-outs were up 28.5 % and holds filled increased 15.5%

With the already small work areas plus the ever increasing amounts of circulation, holds filled and interlibrary delivery, MCL libraries are struggling to keep operations running smoothly.

Shelf space is too small for the collection

Multnomah County residents benefit from the size and scope of the library's collection which is supported by a materials budget sized to meet customer

[15] Library self check vendors include 3M, Envisionware, Integrated Technology Group, Library Automation Technologies, Libramation, and others.

demand. A constant stream of new materials selected to keep pace with newly available material ensures that MCL customers will have the current titles they desire. The materials budget ensures that the collection stays fresh and appealing to the diverse communities the library serves. The limited shelf space in library locations, however, creates a situation where the library must constantly weed to make room for the new material. While this is a standard practice of collection management, the scale of weeding required at MCL due to limitation on shelf space compromises the scope of the collection itself.

Deselection (aka weeding) has become a challenging task that consumes staff time in an attempt to create more shelf space. The library weeds in several ways, including monthly scheduled branch weeds using teams of library staff and community volunteers. In addition, the Selections Office works with branch staff to produce reports on low circulating items in specific collection areas to support weeding by branch staff. Staff in many locations weed daily as part of general operations. All libraries weed based on condition (i.e., items are discarded when they become worn or damaged) on a continual basis.

The need to remove materials from the collection due to lack of adequate shelf space has gone beyond good practice. It works against collection richness and limits the ready supply of materials on the shelf. It negatively impacts the customer experience by forcing the removal of materials that are not the most popular but still have relevance and appeal.

Confluence of factors

The combined effect of these critical factors is that MCL libraries are bursting at the seams: interlibrary delivery demands continue to grow and sometimes there is not enough space to leave all the items ready for delivery at a given library; it is difficult to keep up with incoming new material and weeding requirements; and, the shelves are more full than is ideal for optimizing browsing for customers and ensuring that management tasks can be performed efficiently.

Some of the libraries are too small for self check-out machines. Others have them but they are not used very often because the machines are difficult to use and picking up DVDs or any media item on hold requires a visit to the circulation desk anyway.

The effect, over time, of these interacting factors is a worsening cycle. More holds causes more work for staff in processing the material and the delivered items take up more back office space so staff cannot work efficiently. More holds also requires more dedicated holds shelving. More dedicated holds shelving takes space away from the rest of the collection which reduces the number of titles available to people walking into the library. This causes some libraries to crowd more material into smaller spaces so that fewer books are on display. When customers don't find what they want in the library, they place yet more holds which creates more work for staff, which takes up more workspace and more shelving dedicated to holds, and on and on.

Limited options

There are a number of options to consider for addressing the current situation, but most are not desirable and/or viable: stop allowing patrons to place holds; replace libraries that are too small with new, bigger libraries; reduce the materials budget; reduce the size of each library's collection to make more room for holds and staff work areas; deliver requested items directly to library customers for free; extend loan periods.

Discontinuing the service of self-service holds is not desirable because it would take away one of the Library's most popular services. Building new libraries with more shelf space and larger workrooms is not the most cost effective or efficient way to solve materials storage and handling problems that exist at all the outlets. Reducing the materials budget or the size of the library's collection would reduce its popularity and value to the community. Delivering requested material directly to library customers would be extremely popular but difficult to sustain financially (it is now available for a $2 per item fee and is lightly used).

It is important that any proposed solution adds value to each library outlet and does not weaken the appeal and relevance to the community it serves. In the report "Libraries That Matter" by the Project for Public Spaces, authors Cynthia Nikitin and Josh Jackson describe the success of "libraries that matter" to their communities:

At their best, these new libraries serve as centers of discovery and communication--places where people gather and where information comes alive through teaching and personal interaction. Indeed, to distinguish themselves in a world where Google is well on its way to digitally scanning most of the books ever written, libraries are learning to take advantage of the simple fact that they are centrally located in almost every community. In other words, libraries now see success being linked to their role as public places and destinations.[16]

MCL's community libraries are enjoying more activity than ever before. People flood the libraries to use the public computers. Programs ranging from early literacy to ESL and story times to summer reading are at (and over) capacity. The libraries provide a safe place for kids to go after school to socialize and do homework. New Americans rely on their community libraries for educational material. Immigrants count on the community libraries for news and entertainment in their native language. And some people just use the community libraries to pick up their requested material. The physical space of each library is more important then ever before as both a venue and a resource center. And, as is already being seen, when the economy suffers, library use goes up, so helping the community libraries flourish is now essential.

These critical factors suggest that solutions that will most benefit MCL will result in creating more space in the community libraries for programs and people without reducing the size of the collection and the availability of new and popular material.

[16] Nitikin, C. & Jackson, J. (2007, April). Libraries That Matter [online report]. Project for Public Spaces. Available from http://www.pps.org/info/newsletter/april2007/libraries_that_matter/

Proposed Solutions

The recommendations being proposed fall into the following six groups:

1. Group One: automate the sort and delivery operations;
2. Group Two: create an off-site storage system that is integrated with the central sort operation;
3. Group Three: add automated sorters at Central and three regional libraries;
4. Group Four: add stand-alone bookdrops and expand the Delivery team;
5. Group Five: make policy and procedure changes; and
6. Group Six: expand self-service options.

The first, second, and third group of recommendations are multi-faceted and capital intensive. These recommendations will provide the greatest support for MCL's community libraries, will alleviate the materials handling backlog, and help ensure that MCL continues to provide excellent service to its communities well into the future. To be most cost effective, Group One and Group Two recommendations should be implemented at one time.

The fourth group of recommendations will provide some immediate relief to the neighborhood libraries plus it will result in more convenient materials return for customers. This could be done immediately.

The fifth set of recommendations includes suggestions for modifying MCL policies and procedures to better position the Library for the future. Some of these recommendations will help alleviate some of the pain points while the larger, capital-intensive recommendations are put into place.

Finally, the last set of recommendations is provided to help the Library move forward toward a service model that conforms to current thinking about appropriate service models and use of library space that addresses both the needs of customers and library staff.

Group One Recommendations: Automated Centralized Sort

The most effective way to help alleviate the overcrowding problems in the libraries (aka too much material and too many people in too small spaces), is to move as much as possible of the processing of material to a central, optimized location. Automating the sort and delivery operation will do just that.

The functional characteristics of the automated sort operation include:

1. Automated sorter with at least 100 sort locations to provide rough sorted material (Returns (RTS), holds, media, possibly other categories) to each location;

2. Sorter provides crate check-in so that individual items in a crate are checked in via a batch process;

3. Sorter communicates with ILS to determine status of each item. Status will determine sort location;

4. To ensure next day turnaround system-wide, design characteristics of sorter (throughput, sort speed, number of inductions, number and type of sort locations) must be such that 100% of all library material can be processed daily;

5. Sort operation includes an automated storage and retrieval system (ASRS) that provides staging for delivery crates.

The sorter and automated storage and retrieval system envisioned is based on the King County Library System's operation in Preston.[17] The sorter in Preston is larger than the system required for MCL; however, the basic functionality is similar insofar as the ASRS is coordinated with the sorter via the Warehouse Control System (WCS).

One difference between the Preston system and the recommended MCL system is the off-site storage role that the ASRS plays. At MCL, not only will the system be used for delivery crate staging and storage, but it will also provide an off-site storage option for community libraries, the Central Library, and the system as a whole. This will be discussed in Group Two Recommendations because it could be implemented separately from Recommendation One. However, it would be more cost efficient to implement Recommendations One and Two together.

How the proposed system works

The proposed system includes a sorter, an automated storage and retrieval system, a rack for storing crates, a Warehouse Control System, a stacker/unstacker, and conveyors that move crates where they need to be.

[17] For a video tour of the Preston system, see http://www.youtube.com/watch?v=4fq3CWsyde4

A large storage rack is used for holding incoming and outgoing crates. Cranes are used to move the crates in and out of the rack system. The cranes are controlled by automated storage and retrieval system (ASRS). To extract a crate, a crane moves into position in the rack and pulls out the designated crate. The crate is then placed on a conveyor which takes it either to the stacker (if the crate is being delivered to a driver) or to an induction staff person (if the contents of the crate are waiting to be inducted onto the sorter).

The sorter is used to sort individual items to one of 100 sort locations on the circular sorter. Each sort location holds a crate (if possible, the same crates as used by delivery now) with a capacity of approximately 35 items.

The Warehouse Control System (WCS) is a software program that controls the movement of material between the storage system and the sorter. Conveyors are used to move crates between the rack system and the sorter and to the delivery pick-up/drop-off location. The WCS communicates with the ASRS system.

Stacks of crates are deposited at the delivery/pick-up station for ingestion into the system and taken by conveyor into the ASRS (after being “cingulated (aka unstacked). This station is also where stacks of four crates are delivered for drivers starting their route.

The sorter is equipped with 6 induction stations that are staffed by “induction staff.” Items have to be manually removed from crates and placed on the conveyor where they are automatically fed into the sorter.

The sorter operates by reading the bar code or RFID tag on the item. The WCS communicates with the Library’s ILS via a SIP2 connection. The WCS tells the sorter how to sort the item based on the SIP2 message from the ILS. Depending on the item’s status and the programming of the WCS, the item will be sorted to the appropriate crate (e.g. an Adult Material return crate for Central, or a media return for Belmont, or a Hold for Albina). Initial programming of the WCS will be done with the Library and the AMH vendor; however, once operating, the Library will be able to continually modify the sort program according to their own needs.

Automated sorter provides for crate check-in in libraries

Each sort location is equipped with a bar-coded crate. As the sorter drops items into the crate, the WCS builds a manifest of all the items in each crate so that the crate can be checked in at the library. The crate check-in process will initiate a batch process that causes all the items in the crate to be checked into the ILS. The result of the crate check-in system is that library staff scanning is reduced from 45 scans (of each item) to one scan (of the crate).

Once a sorter crate is 80% full, a light indicates that it needs to be swapped out alerting “chute staff” to remove the full crate and replace it with an empty. The full crate is put on the take-away conveyor which returns the crate to the ASRS system where the crate stays until it is recalled for delivery.

Optimizes loading and unloading of delivery trucks

Drivers unload their trucks to a loading dock in stacks of 4 crates to a take-away conveyor which un-stacks and places each crate into the rack. The fact that drivers can simply drop off stacks of four crates at a time makes the process of unloading the truck very quick and easy.

When drivers arrive to begin their delivery routes, they enter the name of the route they are about to run. The system pulls the appropriate crates out of the rack, stacks them into a stack of four and delivers them to the pick-up station so the driver can load his truck. The system delivers the crates in the order needed for optimizing the driver’s delivery operation, so this part of the process is also very quick and easy.

Group Two Recommendations: Off-site Automated Storage and Retrieval System Integrated with Sort Operation;

The ASRS and rack system described for staging delivery crates can be easily used for providing off-site storage for MCL as well.

The functional characteristics of the off-site storage system are:

1. The rack system will be configured with 8000 crate locations (enough for delivery needs as well as for storing almost 300,000 off-site storage items);

2. The ASRS will be regulated by a Warehouse Control System which will coordinate the traffic in and out of the sorter, ASRS, and will communicate with the ILS;

3. Community library items stored in the off-site storage system can be managed by owning libraries who would continue to be responsible for management of their “off-site” collections;

4. Central library items stored in the off-site storage system would be managed by Central staff who would continue to be responsible for management of their “remote stacks” collections;

5. Crates will be pulled out of the rack by the cranes when items are recalled from off-site storage through the ILS. An off-site storage picker (staff position) will pull requested items out of the crate and induct them onto the sorter for delivery to the requesting library;

6. New acquisitions can be ingested into the sorter just like other interlibrary deliveries. New items automatically trigger holds as they pass through the sorter.

The precise role that an off-site storage option will play must be determined by the Library after clarifying the role of the community libraries and Central. It will require a thorough evaluation of the Library's collection philosophy and policies (see Recommendations 4). There are a number of possibilities that open up with the introduction of this technology and any number of approaches could help resolve the problem of more items in the MCL collection that can fit on library shelves. It will be important for MCL to define a collection management policy that conforms with their collection philosophy.

However, without adding *some* kind of additional storage space for library material, each time a new item is purchased, something has to be weeded. Valuable items are being weeded to make room for new material, the shelves are too full, and there isn't enough space in the libraries for people and activities and backroom workspace.

An off-site storage system optimized for easy and quick retrieval that is integrated with the delivery system creates new opportunities for expanding the collection without worsening the materials storage situation or weeding more heavily than is ideal.

The advantages of storing items in the off-site storage system are:

1. Items stored off-site will be easy to access by making a request through the ILS;

2. Storage of items is more compact and less labor intensive to manage than items in Stacks;

3. Climate control can be better managed in the off-site storage unit than in the basement of the Title Wave (and possibly other places material is currently being stored);

4. Storage of items is cheaper (per square foot) in the off-site storage system than material stored on publicly accessible shelves.

Some of the material that could be moved to the off-site storage system include: Stacks, material from the basement of the Title Wave, popular items being used to fill holds, lover circulating material that has permanent retention value to users (i.e. classics, mid-list fiction and other “long tail” items), seasonal collections, and other sets of material used for programs from the neighborhood libraries. Material currently stored at Central or in Stacks could be moved to the off-site storage system where temperature and moisture would be better controlled and access to materials would be quicker. The system creates an opportunity to rethink how public spaces at Central are used. The system would help create more work space for libraries by removing seasonal and other small collections in the backrooms. It might also create more space in the libraries by allowing some holds to be filled from the off-site collection. And finally, the system may make it possible to keep some of the older items that are currently being weeded due to the number of new items being added to the collection.

How the off-site storage system works for libraries

The ILS system is used to request material from off-site storage just like any other interlibrary transfer. Essentially, staff place “holds” on the material, which results in it being extracted from the storage system and delivered to the requesting library. Management of items in the off-site storage system is a combination of automated and manual processes. As with delivery, the ASRS system keeps track of every item in every container stored in the rack.

When an item is requested through the ILS, the message is sent to the ASRS via the WCS. The WCS tells the ASRS which items are needed and which container that item is in. The ASRS crane pulls the container out of the rack and delivers it to the “ASRS picker” (a staff person) who pulls the requested item out of the crate and places it on a conveyor which takes the item to the sorter. The sorter sorts it to the appropriate crate for delivery based on the WCS program and the ILS message.

The system could also be configured to pull entire crates from the rack so they can be sent directly to the library (without going to the ASRS picker). However, this may have to be handled outside of the ILS system.[18]

[18] This feature was not included in the original specifications provided to FKI Logistex who provided the cost estimates. It could cost more to add this feature than is worthwhile.

Items being returned to the ASRS system or being loaded for the first time into the ASRS are sent to the service center by library staff (the service center appears like another library branch) via delivery like any hold request. The sorter reads the destination and sorts the item to an ASRS crate. When the crate is full, "chute staff" place it on the take away conveyor which takes the crate to the "ASRS picker" position. The "ASRS picker" optimizes the material in the crate before finalizing it for induction into the ASRS.[19] Once finalized, the crate is loaded into the rack.

As envisioned, each library would retain control and management responsibilities over their own off-site storage items. For example, ongoing weeding of off-site storage material would continue to be the responsibility of owning libraries and rotation of material in and out of the off-site facility would be the responsibility of the owning library. Material in off-site storage would be included in the monthly weeding lists generated by Technical Services so that each library treats the locally stored material and their off-site stored material as one unified collection.

Despite the vision presented here, how the off-site collection should be managed will depend on how MCL decides to use the system. Management could be controlled by the Central Library, Stacks staff, or by Collection Management and Technical Services staff. What makes sense for MCL will need to be determined as part of larger collection management plan. To the extent that material can be more easily requested and placed into the off-site storage, it is recommended that a thorough evaluation of material currently stored in stacks and in public shelving at Central be undertaken to determine the best location. Decisions should be based on how frequently items are accessed, how suited the current storage or shelving space is to its current purpose, and how well the environment suits the material (some material may do better on shelves in the basement while other material would benefit from better temperature and moisture controls available in a new facility).

New opportunities for Central

The determination of what to store in each location will have a large impact on the role of the Central Library; however, it is clear that a discussion about the role of Central will need to be undertaken first. Community library door counts continue to go up while visits to the Central Library go down. In order to continue to serve the urban population of Portland, changes in how the physical spaces at the Central Library are used must be made. Moving material out of public shelving is one way to create opportunities for redefining many of the Central library spaces.

[19] It is not essential to optimize each crate before storing it in the rack; however, it may be a useful step for crates that are going to reside there for a certain amount of time. The more compact the crates, the greater the capacity of the off-site storage system.

The Central collections (publicly stored material, material in filing cabinets, and material in stacks) as well as the material currently stored in the basement below the Title Wave require evaluation beyond the scope of this report. However, it is clear that adding a high-capacity storage facility in a controlled environment with quick and easy access to individual items opens up an opportunity to completely re-evaluate how system-wide collections should be stored and what role the Central and neighborhood libraries will play.

Group Three Recommendations: Automated Sorters in Libraries.

The Central Library operates a manual sort operation in the basement for sorting items that have been requested by the neighborhood and regional libraries. None of the regional libraries have a sort operation comparable to Central's. The sort area is large enough for its purpose and the space and process has been optimized. It is a manual system, but it is very efficient. Central material going out to other libraries is sorted by Central staff. None of the material is sorted at the Sort Center (at Library Administration). The delivery team picks up all the pre-sorted material and delivers it directly to the libraries.

All returns (at Central and the regional libraries) are sorted to shelving carts. At Central, the ready to shelve material is staged in various "parking lots" throughout the Central Library.

Central and the regional libraries would benefit from an automated sorter for sorting material to ready-to-shelve book carts and delivery crates.

The functional characteristics of the library sorters suitable for Central and the regional libraries are:

1. Each sorter will have 9-11 sort locations (possibly several more for Central) to allow for rough sorting all returns to ready-to-shelve book carts;

2. Each sorter will have at least one sort location dedicated to material that triggers a hold at another library. This material will be sorted to crates;

3. Each sorter will have at least one sort location dedicated to material that triggers a hold at the local library. This material will be sorted to a ready-to-shelve book cart and a hold slip will be generated at a printer staged next to the sort point;

4. Each sorter will have one staff induction for feeding in returns to the sorter which will be checked in and routed to one of the remaining 7-9 (possibly more at Central) sort locations thus providing rough sorted material ready for shelving. These sort locations can be configured with ready-to-shelf book carts or larger capacity bins;

5. Each sorter will be configured with at least one (possibly several at Central) self check-in units which feeds customer returns directly to the sorter for immediate check-in and holds triggering.

Implementing automated sorters at Central and the regional libraries will eliminate the work of rough sorting material for shelving. The current practice is to use book carts for very rough sorting while checking in material from bookdrop. In the smaller libraries, these shelving carts are then taken out to the shelves and material is fine sorted and shelved. However, in the larger libraries, there is often another sort step in which the rough sorted, just checked-in material is then sorted to another set of shelving carts before shelving. Such a system results in each item being handled multiple times and increases the return-to-shelf time.

For maximum benefit, all returns should be inducted by the public into an automated book return which can be located on an outside wall of the library for 24/7 access or inside the library where it is closer to the sorter (and therefore requires a shorter conveyor run).

With an automated return, the returned material is only handled by a staff person once while being shelved because the automated system checks in the item, sorts it to the proper cart and then the shelver detaches the cart from the sorter to fine sort and shelve the contents of that book cart.

With a bar code based sorter, media returns would still need to be opened to verify the contents of each case; however, with an RFID based system, it may be possible to eliminate even that step.

The sorter can be configured with a variety of sort locations and receptacles. To optimize the return-to-shelf process, sort locations should be configured with ready-to-shelve book carts. However, the ready-to-shelve book carts only hold 40 items so it is important that staff are actively monitoring the sorter (to replace full book carts with empties). Larger bins and trolleys can also be used at sort locations (capacity of 150-200 items each) if it won't be possible to keep up with the number of items being sorted to a particular location.

Material requiring interlibrary delivery can be sorted directly to crates which are easily removed from the system and set aside for drivers to pick up. Incoming delivery items can be inducted into the sorter as well. Even though the items can be checked in at the crate level (with crate check-in), libraries still find that the benefits of sorting to ready-to-shelve carts makes inducting these times into the sorter worthwhile[20].

Libraries introducing automated sorters find that the duties of library staff must change. Duties don't necessarily fall into the traditional page and clerk job descriptions that exist for libraries relying on fully manual systems. For example, staff that had been checking in bookdrop material can be re-allocated to front-of-library activities, do program work, help customers, and assist with shelving (perhaps while roving). The automated sorter provides an opportunity for diversifying the work of all staff because it takes the most time-consuming, physically demanding, and rote tasks away.

Group Four Recommendations: Bookdrops and Technical Services

All operations related to Sort, Delivery and Technical Services will be moved to the service center. Stand-alone bookdrops will be placed in strategic locations and will be the responsibility of Sort and Delivery staff.

1. Add stand-alone bookdrops in busy locations where it is convenient for customers to return material

One relatively easy-to-implement solution is to add stand-alone bookdrops in busy areas to take some of the pressure off the library book returns. The bookdrops will be the responsibility of the service center staff and delivery team. The bookdrops will hold as many as 500 books (1250 DVDs). Placing these units around town at locations convenient for customers provides a way to make returning material even more convenient for customers while reducing overflows in the library bookdrops.

[20] An informal study was conducted at King County in which two comparable libraries were compared. One library used a library sorter and the other used all manual processes. Both libraries received crates that could be checked in (so each item didn't need to be scanned). The library that used the sorter to do the sorting (which involved inducting each individual item into the sorter even though the crate could have been checked in in one fell swoop) used many fewer staff people to do bookdrop and delivery check-in and eliminated their backlog.

The number of bookdrops and their optimal location will require additional analysis of return patterns and library capacity. When selecting bookdrop location, consideration should be given to the convenience it will provide customers as well as the relief it will provide for libraries that receive an inordinate amount of returns. Four of the libraries that are considered "drop off libraries" are Albina, Belmont, Hollywood, and Midland. See Table 3 below. Both Albina and Belmont are very small libraries yet they receive as many as the regional libraries (Hollywood and Midland).

Table 3: Number of items returned in one day at "drop off libraries"

Library	Sample from November 18, 2008
	Returns
Albina	1,269
Belmont	2,357
Hollywood	2,750
Midland	1,884

Adding just four bookdrops for the purpose of deflecting the number of items being returned to these libraries (especially the neighborhood drop off libraries) could reduce their daily bookdrop volume by 25% or more (six bookdrops are recommended).[21]

2. Pick up bookdrop contents daily and check-in material the same day at the central sorter. Next day delivery to destination library guaranteed

Each bookdrop must be visited daily by delivery staff so that material is taken to the service center for check-in at the automated sorter. The benefit of the bookdrops are lost if the material doesn't get checked in promptly. Customers will need to be assured that anything dropped in a library bookdrop by a certain hour will be recorded as returned that day.

[21] Topeka and Shawnee Public Library provides 16 bookdrop locations at markets, shopping centers, and schools. See http://www.tscpl.org/info/section/book_drop_locations/.

3. Move Technical Services to Service Facility

One of the pain points noted by MCL is the shortage of office space at Library Administration. In order to make more space available at Library Administration, all of the workgroups associated with receiving, sorting and delivering material should be moved to the service facility. This includes the entire Technical Services department responsible for selecting, ordering, receiving, cataloging, and processing new material. The Sort Center, Supply Room, and Delivery team would also move to the service facility.

Moving Technical Services along with the Sort and Delivery staff creates a streamlined materials handling environment. New material that is received, processed and ready for distribution to the libraries can be integrated with the workflow of the automated sorter which handles staging of all delivery. Rather than having Sort Center staff trigger holds on new acquisitions (as is done now), the sorter would automatically trigger holds and route the new items accordingly.

4. Centralize work related to snags, redistributing shared collections, and mend/replace tasks

Each library currently dedicates shelf space to CD and DVD cases with missing contents (snags). When CDs and DVDs are returned. staff check to make sure the correct media is inside. When it is missing, the last borrower is contacted. Sometimes the missing media is returned (after the last borrower finds it in their DVD player) but sometimes media ends up in the wrong case. Rather than leaving it up to neighborhood libraries to match the missing parts of a CD or DVD set (after contacting the last borrower), this work should be handled by service center staff.

Shared collection material[22] (aka floating collections) have a tendency to "puddle" meaning sometimes large batches of material are returned to one location. Sometimes the library isn't a good match for the returned material; perhaps they are duplicative of material already on the shelves or perhaps there is just too much for the library to absorb. Rather than calling around to other libraries looking for "takers," it would make more sense for the Technical Services staff to take responsibility for reallocating shared collections when they are returned to the service center by library staff.

[22] Shared, or "floating collections" are items that do not have an owning library associated with them. As such, when they are returned to a library, they stay at that library. The logic behind floating collections is that the customer's use patterns will cause material to move around the system and find its way to the libraries where it will get the most use. This theory has generally proven valid although there are some minor adjustments (like the one described here) that often make it work even better. The incentive for establishing shared collections at MCL was to relieve strain on the delivery and sorting process and to allow the patrons' return patterns to refresh each library's collection.

Mending material and making replacement decisions are more efficiently done at Technical Services. Libraries should send all material to Technical Services for evaluation. If it should be mended, they can do the mending (rather than having mending supplies at every library location). When a replacement should be ordered, they can do so.

Group Five Recommendations: Policies and Procedures

The suggestions in this section are provided for the Library's consideration. Some of the recommendations could be implemented right away to provide some relief from issues associated with backlogs, storage space, and improving the spaces for walk-in customers.

1. **Develop a collection philosophy that clearly addresses the needs of library users today as well as the role of Central and neighborhood library collections. Develop policies that support that philosophy.**

As the role of Central and the neighborhood libraries changes, and as technology and online access changes how people find and use library resources, it is important to adjust the collection philosophy to the new environment. The current approach to collection development is based partly on older ideas about how users use the collection and what they want to use the library spaces for. For example, it may be less important to have the same core fiction titles in each neighborhood library as long as a core set is available to all the people (system-wide) who want a given title.

Access to the entire library system's collection combined with the convenience of placing holds on any item in the collection changes the rules about what needs to be on a library shelf. All libraries, MCL included, have had to gradually change their collection policies to suit the new needs of their library users who want convenient access to more material. However, "convenient' doesn't necessarily mean it must be on their local library shelf.

It may be just as convenient for customers to request the item online and be advised when it is ready (as happens now with the popular holds service). Or perhaps some customers would find it more convenient to use the mail service (which could be provided more cheaply than it is now or on some kind of limited but free basis….or perhaps people just don't know that it is a possibility).

MCL has tried to address the expanded expectations of their users by increasing the numbers of titles on the shelves, but this isn't necessarily the approach that best satisfies user needs.

Now is a good time to conduct a user needs assessment that helps clarify what users want from their local collections and the larger system collection, and what customers consider convenient.

2. Attack holds queues more aggressively

MCL has experimented with Holds Ratios (the number of holds placed for a title compared to the number of copies owned). The current policy is to purchase new copies of a title when the holds to copy ratio reaches 6 to 1 (changed in FY03 from 4 to 1). With additional storage available in the ASRS, the Library could return to a more aggressive holds to copy ratio and reduce the size of the waiting list for popular titles.

3. Establish browse-only "It's Your Lucky Day" collections or titles

One of the ramifications of the current cycle of too much material and too little space is that the holds shelves grow and the browsable material space is reduced. In order to ensure that every customer who comes into a library can find something they are excited about, some library systems have set certain titles to browse-only status.[23]

A browse-only collection can be established for "hot titles"[24] or new acquisitions, or authors in the news or popular genre.[25] The goal is to ensure that customers who prefer to come to the library rather than rely on the holds process always find a range of good choices. When the hold process is available to all material, it often has the effect of cleaning out the local libraries of the most popular titles. Setting aside new purchases or hot titles that cannot be put on hold ensures that both savvy catalog users and walk-in customers will be excited by what they find.

[23] The Central Management Team recommended this same idea to the Executive Team, calling the browse-only titles part of an "It's Your Lucky Day" collection.

[24] Solano County established a "hot titles" collection for bestsellers and feature DVDs. See http://www.solanolibrary.com/about/template.cfm?id=2082 for more information. Pierce County instituted a special "Books Plus to Go" for first-come, first-serve discovery of some of the most in-demand items. See http://www.libraryjournal.com/article/CA6400918.html?nid=3276 for more information.

[25] San Francisco Public Library established a First Stop Browsing Collection. See http://sfpl.lib.ca.us/librarylocations/main/firststop.htm for more information.

4. Expand training and support for library weeding efforts

The key to keeping space available on the shelves for the most desirable material is effective weeding. While the scheduled weeds are very valuable and much appreciated, these only occur every 16 months (the schedule is one library per month). While some libraries have established a strong weeding program, others stated that more frequent scheduled weeds would be useful.

In some cases, additional scheduled weeds are not necessary but additional *training* is required. The libraries that are able to generate their own weeding lists[26] are more likely to perform ongoing weeding tasks. Giving more people rights to the Create Lists feature of the ILS, as well as training in collection management concepts and the importance of weeding to collection health[27] will help increase the weeding activities in the libraries.[28]

5. Establish Service Level Agreements between work groups

Service Level Agreements (SLAs) are useful internal documents between a service provider and a service recipient. It is a *commitment* that accurately and fairly reflects what one workgroup can provide to another and therefore what the recipient workgroup can count on.

[26] Staff at Central and 6 branches have Create Lists capability and run their own collection reports. This group was expanded this past summer. These locations have not needed help from Selections outside of the scheduled weeds.

[27] The Infopeople Project (CA) offered a one-day workshop entitled Weeding for Your Libraries Health (and the workshop material is freely available at http://infopeople.org/training/past/2007/weeding/).

[28] This is largely in the works already. The Collection Action Team has recently drafted a more thorough statement of MCL weeding policies and guidelines and the Selections Office is now working on their draft

One of the benefits of establishing SLAs is the process required to create them. It requires communication between the working groups. For example, an Interlibrary Delivery Service Level Agreement between the delivery department and the libraries receiving delivery requires the libraries to share enough information about their operational needs so that the delivery team understands what is important for the libraries (in terms of delivery) and where there is flexibility. The delivery team in turn shares what capabilities it has and where there is flexibility for them. The two workgroups establish a clear understanding of what each needs, what each can do, and what is most important. The resulting SLA then documents the responsibilities and expectations of both parties, as well as support and escalation procedures.[29]

At MCL, there are interfaces between working groups that would benefit from closer communication and a better understanding of what each needs and what each can reasonably do. Going through the process of developing SLAs is just one way to establish communication and set expectations between workgroups.

To implement many of the changes recommended here will require significant organizational changes which require strong communication throughout the organization. SLAs become the deliverable that ensures the necessary communication occurs. To work effectively, Library leadership must guide the process and infuse the resulting documents with meaning and authority.

Group Six Recommendations: Expand Self-service Options

In the fall of 2001, the library began a campaign to increase the use of self check machines. Soon after, a series of events occurred (unrelated to the self check-out promotion) that resulted in the release of many recently hired clerks and pages who were still on probation. As a result, many people in the Library still associate self check with loss of jobs and use of the self check-out machines was not strongly encouraged by staff.

[29] For a larger discussion about SLAs and how they can be used in libraries, see the blog entry “Using Service Level Agreements Takes the Guesswork out of IT Support” at http://www.galecia.com/weblog/mt/archives/000226.php.

This perception doesn't match the experience of most libraries. Many libraries have found that even as they move aggressively to more self-service options, it rarely results in staffing reductions. Instead, most libraries find that more self-service options (check-in, check-out, fines and fees payment) help them keep up with the increases in circulation while their staffing levels remain relatively flat. The general consensus is that self-service implementations slow the rate that new staff are hired (as library use continues to grow) but more self-service doesn't necessarily result in staff reductions. Instead, new responsibilities can be taken on by existing staff who are no longer overwhelmed with their materials handling and circulation related tasks. Library jobs become more interesting than they were before self-service.

In 2005, self check-out was dealt another serious blow when concern over the loss of DVDs and CDs forced the Library to quickly implement a solution to protect these materials. The only option that was readily available to MCL was to separate the media from the cases for DVDs. CD and DVD holds are also held behind circulation desks. This solution is labor-intensive for staff that became responsible for maintaining two shelving systems (cases shelved in public, and media shelved behind the circulation desk). The policy also discouraged self check use because customers had to get the media from circulation staff. Once at the circulation desk, few people then opt to go to the self check-out machine.

Today, fewer than 20% of the check-outs performed in the neighborhood libraries are done at self check machines. At Central, the percentage is a little better at 34%.

It is important to recognize that it doesn't just benefit library staff, but consumers actually prefer having self-service options[30]. The pervasiveness of self-service holds, accounts management, and self check-out machines is partly in response to materials handling demands but the speed at which libraries have adopted self-service models is largely driven by consumer demand. Libraries find that the more self-sufficient customers can be, the more likely they are to use the library services.

[30] Business Wire. (2007, June 21). NCR Study Shows Consumers are Driving Self-Service." Available from http://findarticles.com/p/articles/mi_m0EIN/is_2007_June_21/ai_n27282243

Self check-out systems caught on in the 1990's and MCL was among the early adopters. The library still uses the first and second generation self check-out machines (3M SelfCheck System Model 6210 and 7210). The first and second generation self check-out machines were large and not very user friendly. Over time, the machines have improved and gotten smaller. Today, self check machines are attractive, sleek, and multi-functional. Not only can they be used for check-out but many also allow for renewals and fines payment, or can be used for both check-in and check-out

Since those first 3M self check-out machines debuted, libraries around the country have learned more about what it takes to successfully implement self check-out. Today, it is not uncommon for libraries to have 85% of their check-outs performed at the self check-out machines. Some libraries have achieved 100% self check-out. However, to achieve such high self check-out rates, these libraries have had to make many changes including training customers, changing staffing models, ensuring that all library material can be checked out at the machines, promoting the use of self check, positioning the machines conveniently for the customer, and ensuring the systems are easy and comfortable for all customers to use.

The MCL 2009 budget includes Program 80022 – Protecting Central Library's Collection. This program calls for replacing the second generation self check-out machines found at Central and installing a theft detection system. Theft detection systems are composed of security gates at all library exits which read tags (or strips) installed in library material. The gates sound an alert if an item that has not been properly checked out passes through.

Adding security gates at Central has system-wide ramifications. Because material flows between Central and all the library branches, every item in the collection (not just items held by Central) will need to be secured in order to be effective. The self check-out machines to be purchased must match the type of security selected (magnetic security strips or RFID tags).

Program 80022 which calls for replacing the old self check-out machines with state-of-the-art systems provides an opportunity for the Library to begin moving forward in some areas that it has lagged behind. The recommendations in this section provide recommendations related to the Program and also provide suggestions for a way that MCL can offer more self-service options for customers, use technology to reduce clerical tasks, and reduce the clerical and materials handling demands overwhelming staff so they can spend more time helping customers use library resources and improving library programs.

1. Move to RFID as part of planned Central security and self check project

While the automated sorter described in this document could be implemented with either RFID or bar codes, since MCL plans to install a security system at Central which requires installing a security tag or strip in all MCL material, it is recommended that MCL choose RFID.

RFID tags have proven to be an efficient and powerful technology for identifying library material and storing data that can be used in materials handling operations including circulation, inventory and sorting (e.g. bar code number and possibly other information such as owning library and next location).

RFID makes self check-out and self check-in systems easier for customers and staff to use because the tag doesn't have to be visible to be read. Items just need to be within 18 inches of a reader for check-in and check-out. Another big benefit to RFID over bar code in circulation functions is that multiple items can be read at once. RFID makes inventory tracking much more manageable and RFID-based automated sorting is more accurate.[31]

In addition to the circulation and materials handling functions that RFID supports, RFID tags also provide security of materials. Unlike bar codes that are only useful for identification of the items, RFID tags identify the items and secure them. During the check-out process, the tag is updated so that the item will not set off the security gate alarms. No magnetic strips are needed. Moving to RFID, as part of the self check/security project at Central, positions the library for streamlined materials handling and circulation processing system-wide.

[31] A bar code based sorter requires the operator to place material with the bar code facing up so that the electronic eye can read the bar code. If the item is placed upside down on the conveyor, the item is sent to an exceptions bin where it must be re-inducted. Smudged or damaged bar codes may also be sent to the exceptions bin. RFID tags, in contrast, do not require a line of sight so items can be placed on the conveyor in any direction, and the location of the bar code does not matter. Either way, the system reads the unique identifier of the item (either on the bar code or the RFID tag) and then looks up the status of the item in the ILS using SIP2 messaging.

2. Make sure RFID contract guarantees tags will work with forthcoming NISO data model standard

RFID use in libraries has been steadily growing. As a result, the tag costs have come down (standard tags currently run under 40 cents each). However, the standards that ensure interoperability between vendors are still not finalized in the United States. NISO has provided a set of recommendations for RFID use in U.S. Libraries[32] which should be followed with any library RFID implementation. In addition, the RFID purchase contract should include a guarantee that all tags provided will be compliant with the forthcoming NISO or ISO data model standard within one year of its adoption without requiring the Library to replace the tags.[33]

3. Roll-out theft detection at all libraries and return to shelving media on publicly browsable shelves

As long as the staff at circulation desks have to manually match media to the cases when customers check-out, the percentage of check-outs occurring on self check machines will remain low. Once RFID tags are installed in all library material, security gates should be installed at all libraries so that the gates can provide the necessary media security required. Media can then be returned to their cases and shelved in public areas without requiring two shelving systems (for media and for cases) and without requiring staff to match the case to the media for check-outs and check-ins.

Allowing the security gates to provide the security (instead of the labor intensive procedure now in place) will save circulation staff time that would be much better spent getting material back on the shelves. It will also save staff workspace and encourage more users to check material out using the self check machines.

4. Replace self check-out machines in community libraries with state-of-the art RFID based system

Once all material is RFID tagged and security gates are in place, the Library should work toward replacing all the current self check-out machines with easier to use, attractive, compact systems. Customers will be impressed with how easy the new systems are to use and will be delighted that they can check-out several items at a time.

[32] Available from the RFID for Library Applications NISO Working Group. See http://www.niso.org/apps/group_public/download.php/116/RP-6-2008.pdf.

[33] Both 3M and Envisionware have signed RFID contracts with library customers that contain this language.

By placing self check-out machines near the hold shelves and positioning the hold shelves near the door, libraries can make it much more convenient for customers to pick up their holds. These customers in particular will appreciate how quick and easy it is to get in and get out without having to stand in line or have staff check them out.

The move to an RFID-based self check-out and security system will also allow the libraries to re-allocate staff and move to staffing models that make more sense for today's library users. Customers want to do their own check-outs, pay their own fines, find items on the shelves and find ready reference questions using Google. They also want help from library staff. But when library staff are too busy sorting material, processing holds and checking out DVDs, they don't have time to provide the kind of help that customers really want (e.g. supporting public computer users, helping kids with homework, planning and running programs, helping people with research).

5. Install self check-in machines at select locations

The next self-service option that should be on the MCL long-range plan is self check-in. Automated self check-in systems can be installed next to or in place of traditional bookdrops. They can be installed outside or inside the library. Customers like them because they can return material before coming inside and then enter the library with no worries about hitting borrowing limits. Unlike returns placed in the bookdrop, there is no delay of hours (or even a day) for items to get taken off a customer account. Items returned to the self check-in system are immediately removed from the customer account so they can again borrow up to their limit. Patrons can also get a receipt for their returns.

Self check-in machines are a big benefit for staff as well because they are usually paired with a small sorter. As items are checked in, they are separated into three or more categories. Items that can be returned to the shelves go into one sort location, items that trigger a hold for a patron request go to another sort location and items that need to be sent out through the delivery system go to another sort location. Items that are checked in and ready to be shelved need not be scanned by a staff person. They can be immediately returned to the library shelves because the automated check-in system does the work of checking in the items and updating the status in the ILS.

Automated check-in systems completely eliminate the repetitive motion of scanning each returned item from circulation staff workflow and greatly decreases the return-to-shelf time of customer returns.

Libraries that would benefit most from self check-in units are Central, Gresham, Midland, and Hollywood. Each of these libraries has high volume and enough space to put in a 9 to 11 bin sorter with at least one external return and one internal return. This would allow material to be checked in and sorted immediately, even while the library was closed. Returns would be rough sorted so that pages could begin reshelving immediately after starting their shift. They would no longer have to begin their day moving bins around and scanning everything that was returned after closing. Holds would each go to dedicated bins so that staff could get them labeled and up on the shelves immediately (many libraries have the holds label print out automatically when holds are triggered during the return, so it would simply be a matter of matching holds labels with the items in a bin).

Depending on how good each library is about keeping up with reshelving, sorters can be configured with book cart chutes, which allow the sorted material to be placed directly on a book cart instead of into a bin. This takes one more step out of the workflow by eliminating the need to move items from the sorter bins to a shelving cart. Instead, the sorter rough sorts (e.g. all adult fiction goes to one sort location) directly to a book cart so that pages can remove the cart from the sorter and take it to the shelves for shelving.

Other libraries that would benefit from an automated check-in system if the spaces could be reconfigured to make them fit are: Belmont, Capitol Hill, Gregory Heights, Holgate, North Portland, and St. Johns. However, without at least a three bin sorter to feed the returns into, the automated check-in systems lose much of their value because material must be scanned by staff to determine its status. To be of maximum value (and to justify the expense), each of these libraries would need to be able to find a way to fit in the self check units (either internal or external or both) and a three bin sorter (which requires at least a 6’ by 8’ area inside the library.)

6. Replace circulation and reference desks with single points of service wherever possible

Most of the MCL libraries have both a circulation desk and a reference desk. Clerks work at the circulation desk where they help customers with their accounts, answer phones, get the media from behind the desk for DVDs and CDs on hold, and check-out material. The reference desks are staffed by library assistants or librarians and they provide a number of services from true reference to public computer support to readers’ advisory. Reference staff do much of their program planning and administrative work while at the desk.

It is becoming more common to use a single service desk instead of separate reference and circulation desks. The service desk then becomes the place where all issues can be resolved for customers whether it pertains to circulation, their account, or some other kind of question typically answered by a reference librarian.

Many single service desks are staffed by a clerk as well as a reference librarian. Another approach is to staff the desk with clerks and use on-call reference[34] or roving reference[35] services. Some libraries encourage staff working out on the floor shelving or shelf reading to assist customers at their point of need. Other libraries are adding Greeter positions or "InfoStations"[36] that help customers with basic informational issues and ensure they know where to go to get the help they need. The Public Library of Charlotte and Mecklenburg County implemented a Unified Services in which a defined set of core services would be offered at every service point.[37] The focus of these new service models is to eliminate the confusion for the customer and bring the help to them, rather than making them deduce which desk or person is the right one for their questions.

[34] On-call reference refers to the model in which the trained professionals providing reference services are allowed to work in the backrooms (which are optimized for their efficient use) but can be called out when a true reference or research question comes up. This sometimes involves expanding the role of the clerks to handle more questions (informational as well as transactional) than they sometimes do.

[35] Roving reference involves the reference librarian moving around the library and engaging customers at their point of need. Roving reference librarians must be trained to recognize when customers need help (and when they don't) and how to approach them without intruding. This model is often accompanied by some kind of paging capability that allows service desk personnel to bring the reference librarian to the service desk (or wherever the customer is that is asking for reference assistance).

[36] See Cerritos Library Fact Sheet including a description of their InfoStations at http://www.ci.cerritos.ca.us/library/fact_sheet.html.

[37] See their staff blog for more information: http://blogs.plcmc.org/category/unified-services/

Benefits to Library Staff

The recommendations will benefit staff working in neighborhood and regional libraries by removing some of the work of processing material, providing staging of material outside of the libraries, controlling delivery volumes, reducing bookdrop volume, providing opportunities for optimizing backroom areas, and reducing the amount of repetitive work done by clerks and pages.

Automated sorter eliminates sorting of outgoing delivery and reduces space required to stage outgoing delivery

One way that space and time will be saved is by eliminating the need to sort outgoing delivery at each library. Because all of the sorting will be automated (based on reading the items' bar code number or RFID tag), nothing needs to be sorted in the libraries. Instead, all material for another library (whether it is a return or a hold, whether it is for Central or another branch) can be placed in the same crate. This will result in fewer crates because each crate will be filled before a second crate is put in position. There should be no more partial crates moving through the system. In addition, fewer open crates will need to be spread around the backroom for sorting into (currently each library sorts to at least 5 open crates, and often more).

Libraries receive rough sorted delivery that can be checked in at the crate level which reduces processing time and helps relieve pressure in backrooms

With automated sorting, the sorter is able to keep track of each item that is placed in each crate so that it can build a manifest associated with the crate. At the receiving library, the staff person scans the bar code on the crate to update the status of all the items in that crate (e.g. "In Transit" status is changed to "Being Shelved" and hold notices are automatically sent out).

Crate check-in saves approximately 40 manual scans per crate which will result in quicker processing time for delivery material. Each day's delivery will be checked in and ready for shelving in a fraction of the time it currently requires and fewer people will be tasked with doing the check-in work. As a result, more staff can be involved in shelving material and eliminating the crates that take up much-needed workspace. If delivery schedules and staffing can be coordinated, it may even be possible to have all delivery material checked in and shelved before opening the doors to the public.

In addition to crate check-in which will be provided for every library, it is also possible to provide additional pre-sorted crates. Each library will likely want to receive crates dedicated to holds, returns and media at the very least. The 100-sort location sorter is recommended in order to provide the option to add several additional dedicated sort options at each library. For example, some libraries may want to keep adult returns separate from children's returns. Pre-sorted crates could then be taken directly to the children's section (or adult sections) for shelving. This is another way to leverage the sorting system to reduce the problem of too little workspace in the backrooms.

Material being delivered to fill hold requests will be sorted to pre-sorted crates. When the hold crate is checked in at the receiving library, it will check-in all the holds (and the notice will be sent to each customer notifying them of the availability of their requested item) as well as communicate with a printer (as they do now) to generate the holds slips. The pre-sorted crates and hold slips can be taken directly to the holds shelf for shelving so they will be available by the time the customer arrives. Again, this reduces the time crates spend taking up space in the backroom.

Having reduced the time required for receiving delivery by at least 3 minutes per crate[39], staff can spend more time keeping up with shelving, processing bookdrop, and working directly with customers. All delivery and bookdrop items will be back on the shelves more quickly so that fewer crates are clogging up operations in the backrooms. The additional workspace will allow staff to set up their work areas much more efficiently.

[39] Each crate now takes approximately 4 minutes to process (each crate contains 40 items and each item takes 6 seconds to process including taking the item out of the crate, scanning it and placing it on a sorting cart). With crate check-in, it will take only a couple seconds to scan the crate to process all 40 items inside. Then the crate can be rough sorted to shelving carts as it is now or it can be taken out to the public areas as part of the fine sort to shelf process. Which process is more efficient may have to be experimented with library-by-library because it will partly depend on how much pre-sorting is done at the central sort facility (and whether the receiving library has its own sorter).

Bookdrop volume is reduced as a result of new bookdrops along prime commuter routes

All of the libraries receive returns via their external bookdrops 24 hours a day. The design of the bookdrops make it easy for customers to return material (e.g. they are low enough to use from outside the building) but they are not optimized for retrieval of the returns (the inside height of bookdrops is *always* lower than is ideal) nor are the bins into which the material is dropped adequate for the volume returned. During holidays, most libraries remove the bookdrop bins because they overflow and jam the bookdrop chute. Instead of letting items fall into a bin that can be transported to the backroom for processing, the staff lets the items fall onto the floor where they can accumulate without jamming the bookdrop and inconveniencing the library customer. Picking up a large stack of returned material off the floor is ergonomically undesirable and it slows down the process of checking in all the items.

Bookdrop volume is a problem even when the library is open. Most libraries reported that someone empties the bookdrop every 45 minutes, and sometimes even more frequently. This is done to ensure that material is promptly checked in and also to ensure the bookdrops (interior and exterior) do not jam.

Some libraries, including Belmont and Albina, are on very popular transportation routes and receive a disproportionate amount of returned material. Much of this material doesn't belong at their library. Since both libraries are very small, the additional volume is very difficult for staff to absorb.

Adding bookdrops along busy routes will ensure that customers continue to have a convenient way to return material without creating problems for the libraries located in these areas. However, for the added bookdrops to work effectively, the items must be picked up and checked in each day. Without getting the items checked in immediately, library customers will not want to use them. Therefore, the delivery routes must be modified to include the added bookdrops. These items must be picked up daily and checked in as they are fed into the automated sorter.

Automated self check-in systems with sorters reduce processing time associated with bookdrop and free up work space in the backrooms

Self check-in machines with even a small sorter take several steps out of the processing workflow and relieve staff of the repetitive motions associated with checking in bookdrop material. The system checks in the items and rough sorts material either to a bin or possibly even to book carts that can be used for shelving.

Staff dedicated to checking in bookdrop can be redeployed to shelving material which will ensure that the limited back office spaces are used for working rather than staging material in crates and on book carts waiting to be checked in.

Even the larger sorters (recommended for Central, Hollywood, Midland, and Gresham) take up less space than the space currently taken up with book carts waiting to be shelved and the numerous shelving carts parked around check-in stations. Once spaces are reconfigured to accommodate the sorters, the library will be able to keep up with bookdrop returns so that growing numbers of parked book carts no longer clutter the back office after the weekends and holidays (and other busy periods). All library staff will benefit from the additional work space that will be available for use.

Off-site storage system provides temporary storage for libraries and provides easy recall capability

The off-site storage system must be large enough to accommodate some storage capability for the entire library system as well as for individual libraries. Many libraries currently stash out-of-season material in their backrooms. With the proposed system, these items could be sent to their own off-site storage area without removing them from their own collection. Each library should also be given some discretion in having its own “just-in-time” collection. For example, extra copies of items the library knows will be needed for an annual school project or which regularly appear on their “staff picks” lists could be kept there, or book club material, or certain low-circulating items.

The details of how an individual library is expected to use their off-site storage space will need to be developed system-wide so as not to conflict with the system-wide off-site storage function of the system.

More frequent deliveries make each delivery easier to manage

Adding more frequent stops of interlibrary deliveries helps even out the flow of material at each library. Rather than having 50 crates to work around, each library will receive fewer crates with each delivery and will have fewer outgoing crates taking up space. The library workspaces are generally too small for the number of people working in the library even before staged crates are added to the space demands (with some exceptions). Reducing the volume of material staged by increasing the deliveries helps ensure that each library can operate efficiently.

Off-site storage system helps regulate delivery

The off-site storage system can be used system-wide for staging material when delivery volumes exceed the space available in individual libraries. Currently, publishing cycles, holiday closures and other seasonal variations result in some very large batches of material arriving in the libraries regardless of the individual library's readiness to receive it. Being able to stage this material in the storage system for delivery on a more graduated schedule would eliminate many of the backlogs that result when a library gets inundated with more crates than they can comfortably fit in their backrooms. Efficiency inevitably suffers when too much material is stored in the backrooms and this worsens the situation.

Libraries can redesign backrooms for efficiency when fewer crates need to be staged there

With fewer crates being staged in the backrooms, the libraries can redesign their work areas for more efficient operation. Many of the backrooms now include large areas set aside for more crates than will be necessary with the new system. Personal work spaces and bookdrop processing areas have suffered as a result of workers competing for the little bit of space that is left behind.

Some libraries have done an excellent job of segmenting their back office spaces and ensuring that shelving carts can be shared by people checking in material and that the shelving carts are within easy reach of the processors. With better promulgation of best practices, these sorts of efforts would be duplicated system-wide.

Snags, unwanted shared collection items, and mends all go into delivery instead of using up branch library space and staff time

In addition to the interlibrary delivery items, it is recommended that all snags, weeded items and items for mending also go out with the day's delivery for further evaluation and processing by Technical Services staff. Items from the shared collection that are unwanted or which do not fit into a library would also go to the service center for evaluation or distribution to a different location. Removing these items from the libraries will clear another 8-10 linear feet of shelving (in the backrooms) and save some shelving space in the public shelves (for unwanted shared collection items). Eliminating the work of matching pieces of snags (except perhaps the initial inquiry to the last borrower of the item) will save time of the library staff which again results in more time for shelving and customer-facing work.

Expanding self-service (check-out and check-in) and eliminating the media from behind the desk options expands role of library clerks and provides more opportunities for positive interactions with customers

MCL clerks face a crushing amount of materials handling related work. Clerks are primarily responsible for manually checking in delivery and bookdrop material, checking out customers at the circulation desk, and dealing with holds (processing incoming holds, labeling them, and removing expired holds and processing them for delivery). Given the volume of material moving in and out of each library, clerks have little time for work that might be more satisfying (e.g. greeting customers and providing informational assistance, assisting customers using the public computers, helping with library programs, roving, or assisting reference or administrative staff).

Part of the work of the clerk is to help customers with their accounts (e.g. issue new library cards, help with fine and fee payment) and give customers the media for their “on hold” DVDs and CDs. However, even though these tasks involve direct customer contact, they are often rushed as the clerk works to reduce the line of people waiting to check-in while facing the stack of crates waiting to be checked in.

By automating many of the tasks now handled by clerks, the library creates an opportunity for expanding the tasks performed by clerks and reducing the stress level of their work. Between the crate check-in, pre-sorted material provided by delivery, using RFID to secure the media, and the expanded use of self check-out machines, the clerk role can be modified to include a much broader range of tasks that are likely to be more satisfying, less stressful, and less physically and ergonomically difficult than the work being asked of clerks today.

For self-service to work, it is important that all aspects of the library operation support it. For example, if self check-out machines are to be used successfully, it is important that all material can be processed easily at the self check machines. It does not benefit customers or library clerks if customers get part way through their self check-out process only to find that they can’t check-out one or two items. This results in a high ratio of frustrated customers going to the circulation desk to finish their transactions.

To some extent, this is the situation that the library is in right now with the self check-out machines. Many items cannot be read at the self check-out machines but the customer doesn't know this until they are well into their transaction. Similarly, some items from the Central stacks do not have bar codes so cannot be checked out using the self-service machines. Plus, the obvious problem of having to get media at the circulation desk makes it unlikely that many transactions will succeed from beginning to end. The result is that those customers who do try to use the machines end up frustrated at the circulation desk. To be a successful self check-in implementation, policy changes (e.g. make it possible use self check-out for all media, make sure every item in the collection has a bar code or RFID tag, provide training and support for customers) will need to be made to support the new self-service model.

Reducing the space occupied by two service desks (circulation and reference) and moving to single point of service can result in optimized workspaces, and opens up more space in the public areas

A single service desk eliminates the space being taken up by large circulation and reference desks leaving more room in the public areas for customers or material. During a public service shift both reference and circulation staff spend more time on the floor interacting directly with patrons. Desk work would then be moved to the backroom areas where staff could work more efficiently without being disturbed. However, this may be difficult at MCL because the workrooms are so small. But as the large number of crates is reduced through more efficient processing, it may be possible to start moving in the direction of reducing the size of the desks on the floor while making it easier for customers to find help, and optimizing work areas in the backroom.

New service models provide opportunities for volunteers to contribute in new ways

As the library moves away from the traditional reference desk/circulation desk model and experiments with single points of service and/or roving service representatives and/or greeters, they will find new opportunities for volunteers. Many volunteers prefer work that involves direct customer contact and roving while shelving books or staffing a greeter desk are excellent ways to make use of the volunteers eager to remain involved in MCL operations but who find the work of materials handling difficult or unenjoyable.

Additional Benefits to Central Library

In addition to the benefits discussed above which accrue to all library staff, there are also additional benefits for the Central Library as it struggles to function in its multi-faceted roles. Customers use Central differently than they did a few years ago. Now, more and more people are requesting items from the Central collection but they are picking them up at the neighborhood and regional libraries.

While the other libraries serve a suburban population, Central's local population is urban. Urban libraries face different challenges related to security and have higher demands on their public access computers. The browsing collection is used but the characteristics of the collection must meet a much broader range of interests and information needs.

In addition, with the closed stacks available in the basement, plus the government and historical records available on browsing shelves, the Central Library serves many of the functions of a research library and government repository.

Off-site storage system reduces some of the workload for Central and Stacks staff

Some of the pressure faced by Central can be alleviated by putting some of its browsable material into the off-site storage system where items can be more easily pulled to fill branch requests. Storing items in the off-site system will reduce the workload for Central, and save space on Central shelves.

Because of the trend away from Central as a materials pick-up location, Central staff commit many hours to pulling material in response to requests from branch libraries. The layout of the collection throughout the building including the fact that material is distributed over three floors (plus two basement floors) and in several different rooms makes pulling items and shelving material a very staff intensive process.

Each of the last two years, Central has filled over 400,000 hold requests (approximately 750 items per day). Filling each hold includes not only finding the item and sending it out via delivery but also reshelving it when it is returned. Because of the layout of the Central Library, this is very labor intensive. As many as 16 people spend 10-15 hours pulling 800 – 1,000 items per day. Five pages then spend another hour each (at least) to pack the pulled items into crates. The Stacks department also commits resources to pulling items to fill hold requests.

While some staff in the neighborhood libraries have the impression that items requested from Central have a much longer turnaround time than material requested from other libraries, it is probably not true. It may have been true years ago but the current procedures in place at Central ensure that items are pulled and ready for outgoing delivery the same day. Central staff also sort their own items so all items are pre-sorted for each branch. Delivery staff pick up the pre-sorted crates and deliver them on the same or next delivery day to community libraries.

With some of the Central collection in off-site storage, the number of holds needing to be pulled by Central and Stacks staff will be reduced and the process is more efficient when implemented with an ASRS.[40] Instead of walking around the library or through the stacks with a book cart locating the items on the shelf, the ASRS system brings the crate containing the requested item to the operator who pulls out the requested item(s) and sends them to the sorter (via conveyor) to the delivery system. And, the items will always be where they should be (because they've been placed there by the ASRS system itself).

Stacks staff estimate that a list of 50 items takes approximately 75 minutes to pull, scan and crate (90 seconds per item). With ASRS system, each crate takes approximately 2 minutes to extract from the rack. With three cranes, a minimum of three items can be pulled at a time (40 seconds per item plus the time it takes to pull the item(s) out of the crate and set it on the conveyor). The more items in the same crate, the faster this process will be.

With an automated sorter at Central, the pulled items can be sent to the service center for sorting or they could be inducted into the sorter for sorting to crates. If the Central sorter is to be used for both rough sorting returns as well as sorting outgoing delivery, a larger sorter (than the 9-11 bin version recommended) will be necessary.

[40] Chicago State University implemented an ASRS system that was located in a warehouse connected to the library. They reported that retrieval time was reduced from 30 minutes (the length of time it took some students to find material on the shelves) to three minutes for the ASRS system to deliver the item to the circulation desk (see http://articles.latimes.com/2007/apr/22/nation/na-robots22). The more commonly reported retrieval time is 15 minutes per item (however, more than one item can be retrieved simultaneously).

The Central Library's physical spaces can be repurposed to address the needs of Central Library customers

The most popular part of the Central Library (the Popular Library and the Children's Library on the first floor) is also the smallest part of the library. The largest part of the library (the Humanities Library on the third floor) is the least used part of the library. Some percentage of the Central Library collection (perhaps as much as half) does not need to be stored on publicly browsable shelves at Central; however, the material is valuable and should not be discarded.

Moving a large percentage of the Central Library collection to the off-site storage system would create an opportunity for the Central Library to reconfigure the spaces to accommodate the current needs of Central Library customers. Central staff report that more room is needed for library programming. A quiet study area (click-free zone) and a computer lab are also needed. These are all standard features of any urban library being built today. Most libraries also include dedicated Teen areas separate from the children's area where gaming and social activities can take place.

As long as the Central Library bears the burden of storing so much of the low-circulating MCL collection, it will be unable to develop the physical spaces needed to satisfy today's public library users (especially urban users).

Off-site storage will allow Central to increase the number of popular items in the collection

Moving some of the low circulating items to off-site storage from other parts of the library would allow Central to grow its most popular collection. The size of the popular collection is now restricted by other collections, the fact that the popular collection should remain on the first floor, and the large amount of space that also is dedicated to holds, public computers, and CD/DVD pick-up.

Benefits to MCL Customers

The recommendations included here provide benefits to library users by ensuring that material turnaround is quicker, available holds are ready within 24 hours, the library shelves are easy to browse with displayed material that entices them, check-in and check-out is easy and convenient, and the library spaces can be used for a wider variety of activities.

Library can expand collection

With more room in off-site storage, the library's collection can grow. The current collection size (1.9 million items) is small considering the population being served. Based on collection size and population served, MCL has 2.8 volumes per capita versus 3.8 (on average) at comparable libraries.[41]

More likely to find items they want on the shelves

In eliminating the back logs of ready-to-shelve book carts and delivery crates, and getting material back on the shelves quickly, customers will more often find the items they are looking for. Most material should be back on the shelves within a few hours of being checked-in at the service center because of the frequent deliveries made to each library and the quick receiving process at each library. Material returned to bookdrops equipped with self check-in systems could be back on the shelves within hours if not minutes.

More ways to return material and quicker check-in

The additional bookdrops will (with guaranteed same day check-in) make it even easier for customers to use the library. Given the importance of convenience to customers today, conveniently located bookdrops will appeal to a wide range of patrons. Parents with kids in the car can return material without leaving the car. Commuters can easily return items as part of their daily commute. Bicyclists can use the bookdrops without having to lock-up their bikes.

Faster turnaround times for requested items

Customers don't understand why material listed as "available" can't be available to them (delivered to their desired pick-up location and "available" on the shelf) within 24 hours. The distance from one library to another is less than 25 miles. Their experience is that something can be ordered online from New York and delivered the next day so what can be so difficult about getting a book from one library to another.

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[41] Holdings per capita at comparable libraries based on 2007 Public Library Data Service Statistical Report (2007) and are as follows: Columbus Metro 3.0, Cuyahoga County 5.3, Hennepin County 2.5, Denver Public 4.3.

While it is true that libraries don't have the resources of most of those online companies, it is also true that libraries need to do a better job at meeting customer expectations. Providing next day service for items that are available at another location is achievable with the recommendations included here.

More "long tail" items available

One of the benefits of adding an off-site storage system like the one envisioned here is that the collection philosophy can be modified in such a way as to provide "long tail" items for customers. "Long tail" refers to the titles that may not have broad appeal but they are valuable nonetheless. The term was coined by Chris Anderson who argued that "products that are in low demand or have low sales volume can collectively make up a market share that rivals or exceeds the relatively few current bestsellers and blockbusters, if the store or distribution channel is large enough."[42]

Libraries have the potential for contributing significantly to the long tail of books and other historical documents. When libraries are forced to weed material based primarily on low circulation, some of the niche titles one finds in the long tail get lost.

In particular at MCL, the limited amount of shelf space in the libraries combined with the enormous popularity of certain titles, has forced the library to weed potential long tail items to make room for the more popular items. The off-site storage system can be used to store low-circulating but valuable material so that when they are sought by library customers, the library can still provide them.

More personal attention from staff

Keeping up with material processing requires the full-time attention of pages, volunteers, and clerks. In addition, library assistants and librarians are often called in to handle the load. The result is less personal attention is available for library customers, and less programming is planned in the libraries.

Reducing the processing work done by staff in the libraries creates opportunities for greater involvement in the communities and with individual customers who come through the libraries. This is particularly important at a time when information is readily available and it is often the services, programming, and individual assistance that is most valued by walk-in customers.

[42] Taken from Wikipedia's Long Tail entry available from http://en.wikipedia.org/wiki/The_Long_Tail

The Library can create physical spaces that support programs and activities people expect from today's public libraries by moving material off some library shelves while making access to all library material fast and convenient

Public libraries are much more than repositories of books and magazines. They are important community and civic places. They support a wide range of activities for people of all ages and with varied interests. While access to books, databases, electronic resources, computers, DVDs and other material is still important, it is no longer sufficient. As long as access to resources is quick and easy, it matters less and less where those resources are stored. In fact, in many cases, the format of the material is less and less important. The latest novel by a favorite author may be equally satisfying as a book, book-on-CD or downloadable audiobook.

The job of the library is to help the customer make the connection to the resource but the "how" is less pertinent to the customer. Library users expect fast turnaround and they have high expectations about what should be findable for them. And, in the meantime, they expect to be able to read quietly, pick up the latest Harry Potter, check their email, read the latest news from their home of origin, or play computer games with their schoolmates.

In other words, the demands on the staff and the physical spaces are high. In order to meet these challenges, new libraries are being built that are large, open spaces with less emphasis on the books. At MCL, where the spaces are small, it is important to ensure that the items on the community library shelves earn their keep in terms of circulation and their appeal to browsing patrons. Material that is less popular with walk-in customers but is a good addition to the collection might be a candidate for off-site storage.