

WHITE PAPER

# SPACE PLANNING CONSIDERATIONS FOR LIBRARY REPURPOSING

Meeting New Library Needs by Repurposing  
Old Library Spaces

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Over the last two decades, academic and public libraries have started to transform themselves from passive service providers to active and vital forces on a college campus or in a local community. This transformation is due to many factors, including changes in technology and the way we access information, concerns about climate change and the integration of sustainable design into our buildings, and the desire for a more collaborative approach to both the way we learn and the way we work.

Today's library patron expects to find computer labs with access to the Internet, free wireless connections for their mobile devices, employment services, meeting and workshop spaces, lounges, study rooms and even cafés. In a recent study conducted by Gensler, forty-three percent of students, when asked, stated that the library is where they would prefer to study. But, when asked to report where they had actually studied, only 22% report studying in the library. <sup>ii</sup> Students want to study at the library, but they are more likely to head elsewhere when they don't find the space or atmosphere they need.

Libraries of all types have faced the challenge of transitioning from simple book collections to multifunctional learning centers and community

gathering places. As the demand for increased and improved services grows, so grows the need for more space – often without the luxury of a growing budget, and this is when repurposing existing spaces within the library becomes the best option.

There are several key drivers to consider when beginning your repurposing project. First, you must assess the overarching goals of the library and determine what new spaces you need and what existing product you have that can be re-used.

*To assist with discovering your repurposing needs, use these questions on the right to begin the planning process. <sup>iii,iv</sup>*

Library repurposing involves creating space on-site for new functions without eliminating the collections that need to be accessed on a daily basis by staff and patrons. The next step in your process is to determine how to do so.

In this paper we will discuss how high-density mobile storage can relieve space pressure by maximizing space efficiency in collection areas, how off-site storage can free up even more space on-site, and lastly, how sustainable design initiatives can be achieved through the use of smart storage solutions.

## SPACE PLANNING CONSIDERATIONS: THE FUTURE LOOK OF YOUR EXISTING SPACE:

1. What is the Institution's vision, mission and/or goals statement?
2. What are the Institution and/or Library's strategic plans?
3. What new programs/services need to be integrated into the library's services?
4. What existing programs/services may be discontinued?
5. What is the building's history (is it a historical site etc.)?
6. What are the community's culture and demographics?
7. Is sustainable design or LEED® Certification an initiative?
8. Has sufficient shelving been planned to meet the current and future needs of the library?
9. Are the existing shelving units:
  - a. Equipped with a finish that will endure normal use and cleaning?
  - b. Standardized in design and color?
  - c. Designed to have interchangeable parts?
  - d. Equipped with adjustable shelves?
  - e. Equipped with end panels?
10. Are there special features such as:
  - a. Pullout shelves?
  - b. Built-in lighting?
  - c. Electrical access?
  - d. Shelf dividers?
  - e. Range-label holders?
  - f. Shelf-label holders?
  - g. Current periodical shelves?
  - h. Wide-lip newspaper shelves?
  - i. Atlas and dictionary stands?
11. Are there special secured collections that need to be stored?

## PLANNING CONSIDERATIONS FOR HIGH-DENSITY MOBILE STORAGE:

1. Is the building capable of holding the weight of a compact system?
2. Are all ADA and safety codes met?
3. What type of system is being considered?
  - a. Manual: Operates with a push or pull of a fixed handle.
  - b. Mechanical Assist: Operates with a turn of a handle attached to a pulley or lever at the end of the stack range that is connected to a gear system that drives the range.
  - c. Powered: Operates with the push of a button on a control panel activating one or more electrical motors.
4. Does the electrical system have:
  - a. An emergency stop button?
  - b. An automatic lock after displacement?
  - c. Protection against radio frequency interferences?
  - d. A toe-level infrared beam to detect people in the stacks?
5. Is there a "fail-safe system" that stops the movement of the units if an obstacle (especially a person) is encountered?
6. Will moveable stacks be accessible to the public with or without staff assistance?
7. Can the system be expanded?
8. Can the system be moved easily to another location?

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## HIGH-DENSITY MOBILE SHELVING

High-density, or compact storage, is shelving that is mounted on wheeled carriages that run on tracks. These carriages compact together, eliminating the need for multiple aisles and substantially reducing the space required. A user moves the carriages to open the aisle in which a desired item resides, either by turning the handle or by pushing buttons to activate powered units.

Let's look at a couple of examples of how high-density mobile freed up spaces in libraries to make room for alternative uses.

### **BERKELEY LAW SCHOOL:**

In 2006, Berkeley Law School began to think about adding another wing to their library as the existing stacks were at 170% of their capacity. This new addition not only needed to provide more space for library collections, but for students and faculty as well. In addition, it needed to create a refreshed identity for the school in order to help them live up to their status as a top five law school. This all had to be accomplished within a fairly small allotted footprint on the south side of the existing building.

To ensure that the new building was able to accommodate the large law library collection, a detailed space analysis was completed through collaboration between Ratcliff—the architectural firm, Systems and Space—the area's authorized Spacesaver Representative, and the law school's library staff.

Powered high density mobile was chosen to house the collection on the lowest level of the building. By eliminating empty aisles and maximizing shelving height, the team was able to move the entire library collection (close to 875,000 volumes and volume equivalents) to one location, using only 85% of the allotted floor space. Because the library collection is housed on the lowest level of the building (below ground), the upper level spaces are used for student study areas, lecture halls, faculty offices, and even a café.

### **ST. LOUIS PUBLIC LIBRARY:**

The St. Louis Public Library's collection, made up of almost four million items, was originally stored on an old self-supporting structure, seven tiers high in the 101 year-old historic building in downtown St. Louis. As part of a renovation, the stacks area was opened up, and much of the collection was moved into high-density storage systems. This resulted in the consolidation of the collection onto three floors versus ten, and gave the library added space in the existing structure to utilize for other needs.

*If high-density mobile could help your facility with some on-site repurposing, use the questions to the left to better assist in the planning process. <sup>iv</sup>*

The second way to make space on-site for new functional spaces like study areas and meeting rooms is by moving materials to an off-site storage facility.

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## OFF-SITE STORAGE

When high-density mobile is not enough to transform precious on-site space for purposes other than storage, it can also be used off-site at an unused building or warehouse. Statistics show that approximately 140,000 of the 1.1 billion books now on library shelves will go into storage with about 1 million scholarly journals, documents and other materials.

Static High-Bay Storage systems make effective use of space at off-site archival storage facilities by placing books and media on fixed shelving units up to 45 feet (4.5 meters) high in a dense configuration. These facilities have substantial construction costs, as well as long-term costs for staffing, security, climate control, heating, cooling and lighting. Therefore, libraries at institutions in a common geographic area often form consortia to share a facility and its expenses – and sometimes its contents.

One such consortium serves 33 member institutions in Oregon and Washington with 207,000 full-time equivalent students. This private and public collaboration stores 8.8 million titles. In 2006, 335,789 books, CDs, DVDs and other items were borrowed by students, faculty and staff – an increase of 67 percent over the total before the alliance was formed. Requested items are delivered in 24 to 48 hours.

As growing numbers of libraries move low-use materials off-site, Mobile High-Bay Storage has emerged, which applies the basic principles of high-density mobile shelving to archive warehouse environments.

Wake Forest University in Winston-Salem, NC, was using an off-site storage company to house their library overflow material. This company not only charged by the linear foot to store the books, but there was also a cost associated with each time a book needed to be retrieved from the facility and brought back to the library. The University knew that they wanted to continue to open up space within the library, meaning more material would need to go off-site, and making their current solution unsustainable.

The University purchased a warehouse with 50' high ceilings and XTend® Mobile High-Bay storage allowed them the ability to maximize capacity (both the height of the shelving and the elimination of aisles contributed to this) and they were also able to consolidate costs by bringing the material back to the University.

*If off-site storage could help your facility with some on-site repurposing, use the questions to the right to better assist in the planning process. <sup>iv</sup>*

## PLANNING CONSIDERATIONS FOR OFF-SITE STORAGE:

1. Has an off-site storage facility been considered as a place to house secondary or little used materials?
2. Has a policy been established determining what will be placed in remote storage and what will remain in the library?
3. Will the remote storage facility serve one library or will it store books cooperatively from a number of libraries?
4. If access is available, may customers browse the facility or only read?
5. Is there a high-security area for special collections?
6. Is the location of stored materials linked through barcodes, RFID tags, or inventory control numbers to the library's catalog?
7. Has a delivery system been established for quick access to the stored collections for library customers?

## PLANNING CONSIDERATIONS FOR SUSTAINABILITY:

1. Have opportunities to incorporate salvaged materials into building design been considered and potential material suppliers been researched?
2. Have materials with recycled content been considered for use?
3. Are particleboards that emit formaldehyde prohibited in the building?
4. Are low-emitting, solvent-free adhesives specified for the project?
5. Is furniture constructed without particleboards that emit formaldehyde?
6. In evaluating the environmental performance of materials used in the building, have the following been considered:
  - a. Energy efficient with low embodied energy?
  - b. Made of renewable materials?
  - c. Made of post-consumer recycled content?
  - d. Made of pre-consumer recycled content?
  - e. Made of certified wood?
  - f. Low Volatile Organic Compounds (VOC)?
  - g. Recyclable at the end of its useful life?
  - h. Simple to install?
7. Is lighting used for:
  - a. Aesthetics to illuminate the exterior of the library and landscape?
  - b. Security to illuminate the grounds near the library, driveways and parking?
  - c. Utility to illuminate the building, driveways, and parking areas to help people navigate safely to and from the library?
8. Is day lighting used as a passive strategy to improve the indoor environmental quality of the library?
9. Is there a system to reduce the amount of time the lights are on?



## REPURPOSING AROUND SUSTAINABILITY

Many K through 12 schools, college campuses and community libraries are designing new libraries with sustainability and LEED® Certification in mind. It may seem difficult to achieve an environmentally conscious design when simply repurposing, versus building new, but that is not always the case. There are several ways to “green” up your existing site while going through a library repurposing.

Consider Category 1; Sustainable sites, within the LEED rating system. Credits 5.1 & 5.2; Reduced Site Disturbance, involve designing the building with a minimal footprint in order to minimize site disruption. High Density mobile storage helps minimize the building footprint, especially in cases where storage is a major function of the facility.

When in repurposing mode, this category would most apply to off-site storage facilities you may be considering to use in order to free up space on-site. Mobile high-bay storage can save millions in off-site facility construction, especially operational and energy costs when compared with traditional off-site library storage options.

Again looking at the Berkeley Law Library, example we can see that the use of high-density mobile storage on the lowest level of the addition helped to free up the upper levels for other uses (café, meeting rooms, etc.) and also allowed the extensive use of glass throughout those floors.

This is a potential contribution to Indoor Environmental Quality Credit 8.1: Daylight and Views. Access to daylight inside buildings makes for healthier and more comfortable occupants—and is also linked with greater productivity. When designed with proper glare control and

minimized solar heat gain, daylighting provides high-quality light while reducing energy use for lighting and for cooling.

There is also a roof-top garden at the Berkeley Law Library, and because only one level is truly above ground, there is limited visual impact on the surrounding buildings—all part of what makes this a LEED Gold Certified building.

Powered mobile systems can also be designed to automatically turn off when building occupants are not present and motion-sensor aisle lighting reduces energy demand by operating only when aisles are in use. Motion-sensor aisle lighting can be installed on static shelving, as seen at Gateway Community College (Phoenix, AZ) and within a mobile system like at the Temple University Library (Philadelphia, PA).

Using materials made up of larger amounts of recycled content can also contribute to sustainable design. The intent of the Materials and Resources Credit 4: Recycled Content, is to use products that have been made from recycled material. Both post- and pre-consumer materials must be collected for each recycled item used.

Steel shelving (used on both static and mobile storage products) is usually made from between 50 and 90 percent recycled material. At Berkeley Law School the recycled content value of the mobile storage and fixed steel shelving was \$653,514. With the total recycled content value of this job at \$1,650,602 the shelving contributed close to 40% of the Materials and Resources Credit.

*If sustainability is an initiative for your repurposing project, use the questions on the left to better assist in the planning process. <sup>iv</sup>*

## LOOK TOWARD THE FUTURE: REPURPOSE TO REVIVE

When building a new facility is not an option, and yet the need to cater to the modern library patron still exists, repurposing truly is the key. Incorporating storage solutions that move books into a smaller footprint or completely off-site is crucial to this first phase of change. When space is opened up in an existing library, a new atmosphere, filled with new functions, can be created.

What would the revitalization of your library look like?

How will **YOU** use your repurposed space?

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### ABOUT THE AUTHOR

Julie Weber is a LEED GA with over ten years of experience in the architecture, design and furnishings industry. She is currently a Marketing Communications Specialist with Spacesaver Corporation, a leading provider of storage solutions. She holds an Associate of Applied Science in Interior Design from Waukesha County Technical College and a Bachelor of Arts in English from Mount Mary College in Milwaukee Wisconsin. She is an active member of Architecture for Humanity (AFH) - Milwaukee, the Wisconsin Green Building Alliance (WGBA) and the American Society of Interior Design (ASID) Wisconsin Chapter.

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