

Public Library Space Needs: A Planning Outline / 2009

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Author's note

In its earliest form, *Public Library Space Needs: A Planning Outline* was a kind of guerilla pamphlet developed in the early / mid-1980s, outside of DPI's official publication process.

Around that time, I was a member of the Architecture for Public Libraries Committee of the Building and Equipment Section of the Library Administration and Management Association (now the Library Leadership and Management Association) within the American Library Association. The chair of the committee then was Raymond M. Holt, the author of the first edition of the *Wisconsin Library Building Project Handbook*. Ray brought a particular concern to the committee: that existing standards for library floor space—which then typically took some form of a per capita measure—were inadequate to define a library's space need. He urged the committee to develop an alternative.

A few years prior, the Public Library Association had issued its first version of *A Planning Process for Public Libraries*. With *A Planning Process*, PLA effectively abandoned the notion of prescriptive standards for public libraries, arguing in part that the diverse range of public library service needs in communities throughout the nation made a single standard impractical. Instead, PLA recommended a uniform planning process whereby a local library could determine service goals suited to meet the needs of its own local community.

As the Architecture for Public Libraries Committee wrestled with Ray Holt's challenge, it became clear that the old measures of floor space per capita (some of which remain on the books today!) were just as incapable of addressing the diverse range of local needs as were all those other traditional library standards. It became clear that a library's space needs are determined by the resources and services necessary to meet its community's demands and service requirements.

Amid all that, I joined the staff of the Wisconsin Division for Library Services as the Consultant for Public Library Construction and Planning. I continued to play with the ideas generated by the Architecture for Public Libraries Committee, fashioning a simplified space needs assessment model organized around six broad types of floor space. This was folded into a document kept on file in the depths of the centralized word processing operation DPI maintained back then. Whenever a library asked about how to figure out its space need, this lengthy missive was cranked out and mailed. This "form letter" printed out as a kind of booklet and, for all intents and purposes, amounted to the first edition of the *Outline*—all produced initially without the benefit, knowledge, or approval of DPI's editorial staff.

After multiple mailings of this under-the-radar booklet and lots of feedback from a captive audience of Wisconsin public librarians, it was time to formalize the *Outline* into an Official Publication. With extensive support from DPI's editors, Publication No. 8210 appeared in 1988. A revision was published online in 1998.

Since that original publication, a number of state library agencies and state library associations have modeled similar recommended processes on *Public Library Space Needs: A Planning Outline*, including Connecticut, Iowa, Illinois, and Texas.

The late Lee Brawner published *Determining Your Public Library's Future Size: A Needs Assessment and Planning Model*, elaborating the *Outline*'s kernel into a book-length planning methodology. ALA's Building and Equipment Section published *Building Blocks for Planning Functional Library Space*, which provides recommended unit space allowances for elements and features that are typically housed in a library, forming an authoritative basis for an estimate of space need once the library's contents have been determined. In 2007, the Library Buildings and Equipment Section of the International Federation of Library Associations published *IFLA Library Building Guidelines: Developments & Reflections* which includes a variation on the *Outline* as its recommended method for establishing a library's space need.

It's gratifying to see that the *Outline* has "legs," given its modest beginnings. This update reflects the essential facility concerns of public libraries in the early part of the 21st century and with a little luck will continue to be a useful tool for librarians across Wisconsin and beyond.

Thanks to John DeBacher, Consultant for Public Library Administration in the Wisconsin Division for Libraries, Technology, and Community Learning, for shepherding this revision through DPI's production protocols, and to John Thompson of the Indianhead Federated Library System and Deb Haeffner of the South Central Library System, who gave the initial revisions a thorough reading and offered many valuable suggestions.

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Introduction

This outline is intended to help librarians and library trustees determine whether to initiate a facilities planning process. By completing it, librarians and trustees can obtain a general estimate of their library's space needs based on their library's underlying service goals. With that estimate, planners can assess the adequacy of their library's existing overall square footage and determine if a more detailed study is called for.

The process described in this outline evolved from a simple concept—that library space needs are based on what a library must house in order to serve its community adequately. The things a library must house to meet its community's needs all have identifiable spatial requirements. Determine the library's inventory and its space needs follow.

This outline defines six broad types of library space—collection space, reader seating space, staff work space, meeting space, special use space, and nonassignable space (including mechanical space). It suggests how library goals relating to each of these areas can be projected to meet future needs and provides a way to translate resulting service assumptions into space needs.

In brief, the process outlined involves the following steps.

- Identify the library's projected service population, known as the *design population*.
- Estimate the collection inventory the library will provide to meet future service requirements and calculate how much floor space is needed to house that projected collection.
- Estimate the number of seats the library will need to accommodate in-house use of the collection and how much floor space these seats will require.
- Estimate the number of staff work stations that will be necessary to support the staff's projected routines and how much floor space they will require.
- Estimate the type and capacity of meeting rooms that the library will need and how much floor space these will require.
- Calculate an allocation for miscellaneous public- and staff-use space (called *special use space*).
- Calculate an allocation for vestibules, furnace rooms, rest rooms, and other types of nonassignable space.
- Consider whether additional special allocations of space may be needed to accommodate unique features, services, or collections.
- Assemble the estimates for all of these types of space into an overall estimate of space needs.

The results of this examination will inform all subsequent planning by local trustees and library staff. Comparing the findings of this simplified assessment against the space available in the existing building will mark an initial indication of need. The space needs indicated here can be used to evaluate the adequacy of the present site or the amount of property that will be needed at a new location. It can also provide an early gauge of a prospective building project budget.

Library planners must also acknowledge that availability of space, or lack of it, is not the sole reason for examining physical facilities. The need to improve energy efficiency and the condition of heating, ventilating, and air conditioning systems; to insure handicapped accessibility; to adapt to meet the electrical and telecommunications requirements of tomorrow's library technologies; and to assess the general effectiveness of the work flow are other suitable reasons for examining the structure that houses a local library. Changes in community demographics, social trends, and local economic factors may also infuse the discussion. What worked well for the community in the library's former plan of service may constrain the delivery of services today.

However, this outline simplifies the mechanism for assessing a library's space need and does not presume to produce an exhaustive estimate of space needs. It is intended to provide a quick, initial estimate of a library's space needs. Many factors affecting service projections and space needs are beyond the scope of this short publication.

This outline assumes the library has a long range plan of service in place to guide the determination of the future service goals that in turn will shape the library's space needs.

The outline requires use of data that should be readily available to local planners—annual circulation, total holdings, and so on. If a particular data element is not available, it is well within the spirit of this process to make a reasonable estimate of the missing data. A special data-gathering effort could be undertaken, or a sampling exercise might provide useful information to incorporate within this process, but such efforts will involve more time and energy than this outline is meant to require.

We also acknowledge that the outline is written for the Wisconsin library community but may be used by libraries beyond Wisconsin. This may require further adaptations to the methodology. Where the outline refers to the *Wisconsin Public Library Standards*, for example, a library in another state may need to refer instead to that state's standards.

The outline is also designed for a public library service environment, but with creative adaptation could be applied to other type-of-library settings. The essential concepts underlying this methodology can be applied broadly.

Work space is provided throughout the text for calculations and notes. A work sheet is included in Appendix B to help with the calculation of a library's projected overall space need. Examples are also provided to illustrate how to make certain calculations, although the examples are *not* intended to recommend a specific library service level or planning assumption.

Preliminaries: Design Population

Planning for an effective library facility begins with determining the library's design population—identifying the population the expanded library will be expected to serve. Knowing the design population helps library planners calculate several of the service parameters used to assess space needs in the steps which follow.

There are two key factors to consider in establishing the design population. First, the design population should be a projection of the population in the library's service area. Since library buildings are an important capital investment for most communities, it is crucial that they be planned to respond to current *and future* needs. The recommended time frame for planning is 20 years, although if the best available projection extends over a shorter period, adapt the planning horizon and use that projection.

Second, the design population should take into account the fact that the typical Wisconsin library serves an area that extends beyond the boundaries of the municipality in which it is located. The municipality may be considered the library's primary service area, but most public libraries serve individuals from beyond municipal boundaries by virtue of participation in a public library system or county library service or by virtue of reciprocal agreements with neighboring libraries. To ignore the service implications of traffic generated by these individuals would mean planning a facility that would be outgrown too quickly.

Estimates of the projected population for a public library's primary service area—typically the municipality itself—can often be obtained from the municipality, county, or from a regional planning commission. The Wisconsin Department of Administration updates its projections periodically. Local school districts may also be a source for such projections, although the school district's service area may not coincide with the public library's service area.

To this forecast should be added an estimate of the library's nonresident service population. One simple way to estimate the nonresident population is based on the proportion of resident borrowing and the proportion of nonresident borrowing. If one assumes that residents and nonresidents tend to borrow material at roughly the same rate per capita, then the balance between resident and nonresident circulation reflects the balance between the resident and nonresident population. Furthermore, if one assumes that the proportion of resident to nonresident borrowing will remain constant for the duration of the 20-year planning time frame, one can use the current proportion of resident borrowing to calculate the library's projected, extended population—its design population.

The public library statistical database maintained by the Public Library Development Team in the Wisconsin Division for Libraries, Technology and Community Learning (pld.dpi.wi.gov/pld_dm-lib-stat) makes one estimate of the extended service population for every library statewide. While this represents a

useful starting point, the formulas used to devise this estimate may or may not be wholly applicable for this particular purpose for every community in the state.

For other discussions of calculating an extended service population for a public library, see the current edition of the *Wisconsin Public Library Standards* (pld.dpi.wi.gov/files/pld/pdf/standard_2.pdf#page=3). Also refer to the second edition of *Wisconsin Library Building Project Handbook* and Lee Brawner's *Determining Your Public Library's Future Size*. Full citations for these resources may be found in Appendix A.

Formula. To calculate a design population, divide the projected resident population by the percentage of resident borrowing.

Example. The current municipal population of Sampleville is 5,000. The public library's annual circulation is 75,000 items, of which residents borrow 50,000 items, or 66 percent. If a projected municipal population of 8,000 represents 66 percent of the design population, then the current service population also represents 66 percent of the library's total design population. If the municipal population is projected to grow to 6,000 and the ratio between resident and nonresident borrowing remains the same, the estimated design population is 9,010 ($6,000 \div 0.66 = 9,010$).

Be aware that specific local conditions may suggest adjustments to these calculations. If there is reason to believe the balance between resident and nonresident use will shift during the 20-year planning time frame, planners could apply their estimate of the *projected* proportion of resident use to calculate the design population. Other local and regional factors may also come into play, such as whether rural bookmobile service is to be discontinued, or whether a nearby community plans to establish or relocate a library or expand its hours of service.

Step 1

Collection Space

By projecting the library's collection size, planners can quantify the space needed to house the collection. A typical section of library shelving affords a specific amount of linear feet of shelving space, which in turn affords a certain capacity per shelving unit. Each shelving unit occupies a discrete amount of floor space, so one can estimate the number of volumes that can be housed per square foot of floor space. Given this direct link between the size of the collection and the floor space required to house it, projection of collection size is one key to determining a library's space needs.

This outline covers four components commonly found in public library collections:

- books,
- periodicals,
- nonprint material, and
- digital resources.

Other types of material, like microforms, are still found in some collections, but in the interest of keeping this methodology simple and easy to apply, these additional collections are only treated indirectly under Step 1. See Step 8 for further refinements of these estimates.

As with the projection of the library's service population, it is most effective to make these projections over a 20-year period.

Projecting Collection Size

Projections of collection growth should consider at least two factors:

- application of current standards for public library service (for example, *Wisconsin Public Library Standards*); and
- calculation of the library's rate of addition to the collection extended over the planning time frame.

Taken together, these factors can guide library planners as they develop a projection of collection size based on their understanding of a community's library service patterns, priorities, and needs. Standards can be used to suggest a minimum collection size; the library's rate of addition can be used to temper or redirect the recommendation of the standard.

Other factors may come into play as well. A system or county resource library may be obligated to maintain a larger collection than is recommended by the standards. The library's service emphases may also have an effect on collection size.

Each library will also need to assess the impact of the growing availability of information by way of electronic and digital sources. Some libraries anticipate that electronic resources will slow the rate of growth in traditional collections or even reduce the quantities that will be needed in those traditional collections. Other libraries anticipate little effect. Still others anticipate that some parts of the collection (periodicals, reference holdings) will be affected substantially while other parts will be affected less dramatically.

The key to this step, as with every other step in the space needs assessment process, is the board and staff's understanding of local needs. This process assumes that the library has a current collection development policy, and that maintenance of the collection (weeding) is up-to-date.

The application of a standard is a simple way to project collection size. *Wisconsin Public Library Standards* recommends that a local library can define appropriate service goals for growth in its print and nonprint collection through comparisons with other similar libraries. The analysis defines four levels of effort that a library may apply—basic, moderate, enhanced, and excellent. Local planners should determine which level of effort is appropriate for the library and the community. Using the standards, an estimate of collection growth can be calculated based on the library's design population.

Formula. To calculate the recommended collection size using current standards, multiply the standard by the design population.

Example. Planners in Sampleville determined that a “moderate” level of effort regarding the book and nonprint collections was appropriate, but that a “basic” level of effort regarding periodicals was appropriate. Based on a design population of 9,010, the Sampleville Public Library should plan for a collection of 35,139 volumes (at 3.9 volumes per capita), 100 periodical titles (at 11.1 titles per 1,000 population), 1,622 audio recordings (at 0.18 per capita), and 2,523 video recordings (at 0.28 per capita).

The *Wisconsin Public Library Standards* represents one tool for determining future collection size. Sometimes a library needs to apply other measures to define a suitable collection development goal. Many times, it will benefit the library to explore additional techniques for projecting collection size as a means of testing and validating the recommendations made using the standards.

Use the library's recent rate of addition as a check against the application of a standard. Consider both the library's gross rate of addition (annual additions only) and the library's net rate of addition (additions less withdrawals). By the time a library undertakes an assessment of its space needs, available shelf space may be at a premium, which may have prompted an unusually high rate of withdrawals. That could produce an artificially low—and potentially misleading—*net* rate of addition. Calculate the library's rate of gross and net addition as an average over a five or seven or ten year period. This will mitigate the effect of any unusually generous or restrictive years for acquisitions.

As these rates of addition are extended through the library's planning time frame, it creates a counterpoint to the application of a standard. The result may validate the standard, or it may lead staff and board to reexamine their forecasts for collection growth.

Formula. To project collection growth based on the library's rate of addition, multiply the average annual rate of addition by the duration of the planning time frame (typically 20 years); then add the result to the current collection size.

Example. The Sampleville Public Library's collection numbers 28,000 books. Over the last five years 3,550 volumes have been added and 925 volumes withdrawn. Net additions during that period have totaled 2,625. Gross additions have averaged 710 volumes per year; net additions have averaged 525 volumes per year. If the library sustains a rate of addition of 710 volumes per year over the next 20 years, it will add 14,200 volumes, bringing its total holdings to 42,200 volumes. If the library extends its recent net rate of addition over the next 20 years, it will add 10,500 volumes, bringing its total holdings to 38,500 volumes.

Digital and electronic information resources constitute the final component of a library's collection resource. With the increased amount of digital information and resources, it becomes increasingly important for libraries to provide access to that material. The degree and type of access will be conditioned by the number of public access computers that the library provides for patron use. The number of public access computers will in turn determine how much space the library will need in support of this function.

Published formulas to calculate the number of public access computers can vary widely. The *Wisconsin Public Library Standards* recommends a minimum of one public access computer per 1,000 population for libraries serving fewer than 5,000; for libraries serving more than 5,000, the standards recommend one public access computer for every 2,000 population served. The standards also note that the library should provide "a sufficient number of workstations to accommodate patrons with minimal wait times for access to the library's catalog, the Internet, and other electronic resources."

Other factors that may be useful to consider in determining a suitable inventory of public access computer stations can include:

- daily traffic through the building, presently and in the future. Some formulas suggest one terminal for every 20 visits while other recommendations suggest one terminal for every 10 visits (or even fewer)
- the kinds of environments that the library intends to create around its public computer stations (if the setting will foster extended periods of patron use, additional terminals will be needed)
- the degree to which separate hardware platforms are needed to access different digital information resources (if several resources or databases can be accessed via the same computer station, the efficiency of this distribution pattern may translate into a need for fewer terminals)

- the degree to which wireless connectivity and hard-wired access ports will encourage patrons to bring their personal laptops to the library to use (which may reduce the number of machines provided by the library)
- the library's own direct observation of patron queues waiting for access to terminals presently on-site; and
- the experience of neighboring libraries regarding the number of terminals provided for the public.

In consideration of these factors, planners can make an estimate of the number of public computer stations or terminals that will be needed. Note that any terminals provided in a computer training lab (if one is to be included in the library's plans) are tallied in Step 4, "Meeting Room Space." Also note that the immediate goal is to define the space needs for public computer stations now, and in the future. The library will not necessarily provide all of the stations immediately, but will grow into this space.

Calculating Collection Space

Once the size of the collection has been determined, the amount of space necessary to house that collection can be estimated.

Books

The number of volumes that can be stored in a given space may vary from five to 30 volumes per square foot, depending on several factors, including the height of the shelving, the width of the aisles, the type of material—for example, reference versus children's books—and so on.

A general average for books housed in different environments is ten volumes per square foot. This is predicated on housing a normal variety of adult trade books on full-height shelving 84 inches or 90 inches tall installed with a three-foot aisle—and *leaving the top and bottom shelves vacant for future expansion*. More commonly, a library will find it necessary to fill the top and bottom shelves, in which case an average of some 15 volumes per square foot can be achieved. Obviously, the preferences a library has and the choices a library makes with regard to shelving and display strategies will affect its collection capacity per square foot.

The width of the aisle in the collection also affects the library's collection capacity per square foot. The Americans with Disabilities Act currently specifies that the aisles in a library bookstack should be no narrower than 36"—but a 42" aisle is strongly recommended. Some libraries are choosing to install shelving today with an even wider aisle. Obviously, with a wider aisle the collection is spread out over a broader area, and the library achieves a lower capacity per square foot.

Recognizing that all these variables are in play, a library should consider whether it prefers to apply a minimum recommendation for collection capacity per square foot, a moderate recommendation, or an optimum recommendation. A minimum recommendation of 15 volumes per square foot will produce the smallest reasonable area to house the collection. A moderate recommendation of 13 volumes per square

foot will produce a larger area, while an optimum recommendation of 10 volumes per square foot will produce the most generous area for the book collection.

As one shifts between the minimum, moderate, and optimum recommendations, the underlying shelving environment shifts. In a minimum setting, the aisles will be narrower on average (closer to the 36" minimum required by the ADA), shelves will be taller (closer to traditional full-height shelving in the adult collection) and there will be less opportunity for display and marketing of the collection. In a moderate environment, the aisle will be somewhat wider and there will be more opportunities for display and marketing. In an optimum environment, the aisles will be quite wide, the shelving may be lower (and therefore more reachable for more patrons), and there will be marketing options distributed throughout the collection.

Also be aware that the measure one chooses on this spectrum from minimum to moderate to optimum affects one's ability to accommodate other types of collections. Earlier it was noted that the *Outline* process does not necessarily account for *every* segment of a library's collection. Microforms, for example, are not addressed directly. If the library has a notable collection of materials that are not addressed directly in this methodology, accommodate that additional material by using a more generous allocation here. Instead of a moderate allocation of 13 volumes per square foot, apply the optimum allocation of 10 volumes per square foot; the difference between the moderate result and the optimum result will roughly represent a space allocation for the library's "other" collections.

Formula. To estimate the space needed to house the library's book collection, divide the total projected collection by 15, 13, or 10.

Example. According to Sampleville Public Library's application of the standards, a collection of roughly 35,250 volumes is recommended. Local planners agree that a moderate shelving environment is most appropriate. A space allocation of roughly 2,700 square feet will be needed for the collection (35,250 volumes ÷ 13 volumes per square foot = ±2,700 square feet).

As a variation on this formula, libraries that need to house a large print collection may wish to acknowledge the fact that a portion of the collection will be in circulation at any given time. If 10% of the collection is typically in circulation at any given time, the library could plan to provide shelf space for 90% of its entire collection. This, of course, leaves the library with less shelf space to manage its collection during the normal seasonal cycles of use.

Periodicals

Periodicals require two types of shelving—display shelving for current issues and storage shelving for back issues. Determine the number of periodical titles the library can anticipate carrying in the future, noting the recommendations that are included in the *Wisconsin Public Library Standards'* quantitative standards (pld.dpi.wi.gov/pld_standard).

The Americans with Disabilities Act specifies that current periodical display shelving is subject to a height limitation. If an individual in a wheelchair can

approach current periodical display shelving from the side, a 54" maximum vertical reach is allowed; if only a front approach is possible, a maximum 48" vertical reach is allowed. This height restriction affects the number of titles that can be displayed clearly with the full cover exposed as well as the number of titles that can be housed per square foot.

On average, one square foot of floor space is needed for each current issue to be displayed, an allowance that accommodates ADA requirements.

Next, determine the number of periodical titles for which the library will retain back files, and estimate the number of years that will ordinarily be retained. The library may or may not retain back issues for its entire subscription list. Many libraries are reducing the duration of their back files as more of this material becomes available in digital form. Allow 0.5 square feet per title for every year retained.

Formula. To estimate the space needed to display current issues of the library's periodical collection, divide the number of titles to be displayed by 1.0. For periodical storage, multiply the number of titles to be retained by 0.5, and multiply that product by the average number of years to be retained. Add these two figures together.

Example. According to Sampleville Public Library's application of the standards, a collection of 100 magazine titles is recommended. For current issue display, the library will need 100 square feet (100 titles , 1 title per square foot = 100 square feet). The library anticipates keeping all of these titles in back issues, for two years on average. This will require another 100 square feet (100 titles x 2 years x 0.5 = 100 square feet). In all, the Sampleville Public Library will need 200 square feet for its magazine collection.

Nonprint material

For nonprint material, planners should project those holdings 20 years hence using the methods described above. Note recommendations that may be included in applicable public library standards. As with the book collection, once the size of the audio and video collection has been determined, the amount of space necessary to house that collection can be estimated.

Traditionally, the same broad rule of thumb that applied to the book collection has applied to the nonprint collection as well—ten items per square foot. But the same variables are in play within the nonprint collection as are in play with the book collection: taller or lower shelf heights, wider or narrower aisles, more or less marketing and display. As with the book collection, choose a minimum allocation of 15 items per square foot, a moderate allocation of 13 items per square foot, or an optimum allocation of 10 items per square foot. As with the book collection, the minimum allocation will result in a nonprint display with taller shelves, narrower aisles, and fewer opportunities for marketing and display. The optimum allocation will result in nonprint display with lower shelves, wider aisles, and more marketing options.

Formula. To estimate the space needed to house the library's nonprint collection, divide the total projected collection by 15, 13, or 10.

Example. According to Sampleville Public Library's application of the standards, a collection of roughly 4,150 items is recommended (specifically 1,622 audio recordings and 2,523 video recordings). Local planners agree that an optimum shelving environment is most appropriate because they want to be sure to accommodate marketing and display opportunities here. A space allocation of roughly 415 square feet will be needed for the collection (4,150 items ÷ 10 items per square foot = ±415 square feet).

Public access computer stations

The appropriate allocation for a public access computer station depends in part on the type of use the library wishes to encourage at each individual computer. At a computer dedicated for use as an online catalog, for example, the library may want to encourage a higher degree of turnover at that station in order to insure greater patron access to the library's catalog. If this is the library's intent, an OPAC might be presented in a smaller space, at a stand-up station, with a minimum of adjacent counter space. At a public access computer station where the library anticipated encouraging longer-term use, a larger space allocation might accommodate seating for the user and additional adjacent counter space. At a station where a patron can do media production, an even larger allocation could be appropriate to accommodate scanners and other peripherals.

The space allocation needed for public access computer stations will also be affected by the number of computers the library provides. A library that provides a large inventory of public access computers is more likely to achieve economies of scale as the stations are deployed across the floor, and those economies of scale can lead to a smaller space allocation per station. A library with a smaller inventory of public access computers will often need a larger allocation of space per station.

Another factor that affects the space needs of public access computer stations is whether the stations are concentrated or distributed within the library. If the library concentrates its public access computer stations in one or two or three areas or nodes, the layout of this equipment will be more likely to achieve economies of scale through higher density and a smaller allocation per station will be needed. If the stations are distributed throughout the library, the layout will be less likely to benefit from economies of scale, and a larger allocation will be needed per station.

Taking all of these factors into account, a minimum allowance of 35 square feet per public access computer station is recommended. A moderate allowance of 45 square feet per public access computer station is recommended. And an optimum allocation of 50 square feet is recommended.

Formula. To estimate the space needed to house the library's public access computer work stations, multiply the number of terminals by 35, 45, or 50.

Examples. After examining use patterns at Sampleville and the surrounding libraries, planners establish a service goal to provide 30 public access computer

stations. They determine that a moderate allocation of 45 square feet per station is appropriate, given the overall inventory of stations they intend to provide and the way in which they expect to cluster the stations within the library, resulting in a space allocation of 1,350 square feet.

Combined with the previous allocations for the Sampleville Public Library's collections, the total area needed for collections is 4,665 square feet (2,700 square feet for books, 200 square feet for magazines, 415 square feet for nonprint, and 1,350 square feet for public access computer stations).

Step 2

Reader Seating Space

An allowance for reader seating needs to be made. Step 2 provides space for the library's general reader seating. Typically this will include seating at tables, carrels, lounge chairs, and the like. It can also include other types of settings, such as a diner booth that may be provided in a young adult area, or a rocker in a preschool collection. The library will probably provide additional spaces where a patron may sit—at some of the public access computer stations discussed in the previous step or in small group study rooms (which will be discussed in Step 5)—but those examples represent seating provided for a specific, designated purpose. The seating inventory discussed here includes general, undesignated reader seating.

One common, broad recommendation is that a library should provide five reader seats for every 1,000 people in its service area. More detailed guidelines in other planning manuals usually suggest allocating reader seating on a sliding scale, decreasing the number of seats provided per 1,000 population as the total population increases.

The following reader seating schedule based on a library's design population is recommended for use with this space planning outline.

Population	Seats per 1,000 population
1,000	22.50
2,500	14.25
5,000	10.00
10,000	7.00
25,000	4.50
50,000	3.00
100,000	2.25

Conceptually, this pattern should continue for libraries serving larger populations. The corresponding benchmark at 250,000 population would be 1.50 seats per 1,000 population, and the benchmark at 500,000 population would be 1.00. But libraries serving these larger populations are highly likely to operate multiple facilities, which introduces a complexity that is beyond the scope of this simple seating schedule. Reader seating needs for facilities in a multi-facility service setting should be assessed on a case-by-case basis.

For a library with a design population that falls between these benchmarks, the recommended number of seats per 1,000 would be calculated somewhere between the respective seating recommendations. A library serving 22,000 people falls between the 10,000 and 25,000 benchmarks, and its recommended seating level should fall somewhere in the range of 7.00 and 4.50 seats per 1,000 population, say 4.90 seats per 1,000 population. Sampleville Public Library, with a design population

of 9,010 falls between the benchmark of 10.00 seats per 1,000 at a population of 5,000 and the benchmark of 7.00 seats per 1,000 at a population of 10,000. Based on these benchmarks, planners in Sampleville might opt for a recommendation of 7.50 seats per 1,000 population.

This recommendation only establishes a base or starting point for further consideration. Depending on a library's mission and service emphases, it may be appropriate to adjust the recommendation up or down. For instance, if a library's service profile emphasizes delivering popular materials, it may encourage patrons to browse through the collections and select material to be charged out and read at home; long-term in-house use may not be encouraged, and fewer seats may be required. Alternately, a public library that emphasizes a close collaboration with the local schools may specifically encourage long-term in-house use to support students working on assignments, and extra seating may be advantageous. Libraries may also wish to create special lounges with such furniture as booths or overstuffed chairs which can require additional space. Wireless access can also suggest special seating (i.e., tablet arm chairs) and reading tables with additional space.

Just as the *specific* space required to house a library collection depends on the type of shelving used and the type of material stored there, so the exact amount of space needed for reader seating will vary depending on the type of seating. Seating at tables, for example, requires 25 square feet per seat, while seating in a lounge setting requires 40 square feet per seat. Seating in the kind of diner's booth noted earlier will require an allocation toward the upper end of this range. Individual seats that support a folding tablet to support a patron's use of a laptop for wireless access to the library's network will also likely need a somewhat larger allocation.

Within this range of 25 to 40 square feet per seat, as a broad average allow 30 square feet per seat.

Formula. For a general estimate of the space needed to provide adequate reader seating, multiply the number of projected seats by 30 square feet.

Example. Since Sampleville's design population is 9,010, the recommended number of seats per 1,000 population would fall somewhere between 10.00 and 7.00. For purposes of this estimate, planners assume a rate of 7.50 seats per 1,000 population, for 68 seats. At 30 square feet per seat, 2,040 square feet will be required for reader seating.

Step 3

Staff Work Space

Building or expanding a facility offers opportunities to reorganize relationships among existing work stations and to add new work stations to improve service to the community.

To determine the appropriate number of service points and appropriate staffing levels at each service point, examine present staff assignments and workloads. Examine trends in service patterns—increasing reference use or young adult use, for example. Compare local staffing patterns with those of neighboring libraries and other libraries of comparable size.

Examine each existing and prospective department or service area—circulation, technical services, reference, children’s services, and so on. Determine if a service point is appropriate given present or anticipated workloads; if so, identify how many staff members are needed to meet the projected service need.

Note that this refers not to the number of individual employees or the number of full-time equivalents (FTEs) on the library payroll, but to the number of places within the library, or stations, that the staff will need to support the library’s service program. In some situations, several different individuals can occupy a single work station at different times during the week (think of a charging station at a circulation desk). Conversely, in others, it may be desirable to provide two or more work stations for certain employees (a children’s librarian, for instance, may work at a public service desk part of the time and have a separate station or office away from that desk). Concentrating on an inventory of work stations enables planners to focus on the tasks to be performed in a given area and how those tasks relate to other library operations.

Also note that in some libraries the adoption of self-service strategies (self-service—or express—check-out, for example) will have an impact on the distribution of staff work stations and sometimes on the number of staff work stations. As part of this inventory of staff work stations, a library that anticipates shifting the bulk of its circulation transactions to a self-service configuration, may need fewer staff work stations to attend the circulation process. (Note, however, that the reduction in staff work space in this example will likely require an increase in the calculation of the allocation for special use space—see Step 5—to accommodate the necessary inventory of self-service check-out stations.) In other situations, a library may intend the self-service stations to represent an alternative to traditional, staff-mediated circulation, so the inventory of staff work stations may not otherwise change. (The allocation for special use space, though, could well still be increased to accommodate a possible increase in the number of self-service check-out stations.)

Other changes in library operations patterns may result in variations in the inventory of staff work stations. Over the last twenty years, many larger libraries have found a need to create an information technology department to provide staff support to maintain an ever-expanding in-house network. Some smaller libraries have

found an advantage in providing a modest space where network maintenance and simple hardware repairs can be made. A broad increase in the volume of interlibrary loans could prompt the creation of or increase in the number of staff work stations involved with ILL processing. Evolving considerations like these should be taken into account as part of the library's inventory of staff work stations.

The particular furnishings and layout for each staff work station will vary depending on the specific work routine the station supports. Many work places in a staff workroom will be a variation on a cubicle or desk setting. A work station for processing in a technical services department will be configured very differently. Likewise, a work station for sorting recently returned material and preparing them for reshelving will have its own specific requirements.

In a similar fashion, the space needed by individual work stations will vary according to the specific requirements of each station. The space allocation for most staff work stations will fall within a range of 125 to 150 square feet, although some may require even more and others will require less. For purposes of making an initial calculation of the library's space need, apply a minimum recommended allocation of 125 square feet per station. A moderate allocation would be 140 square feet, while an optimum allocation is 150 square feet.

Larger libraries may find that the number of staff work stations that are needed to meet future service demands produces an economy of scale that permits efficiencies in the layout and design of staff work space that in turn allows them to apply a smaller space allocation. In practice, some work stations will likely be larger and others will likely be smaller but on balance a larger library with a larger inventory of staff work stations will be able to apply a smaller unit space allowance for this function. A smaller library will likely need a larger unit space allowance. Final space allocations will be based on further evaluation of the specific routines to be accomplished at each work station and the amount of furniture and equipment necessary to support those routines.

Formula. To estimate the area needed for staff work space, multiply the number of work stations by 125, 140 or 150 square feet.

Example. Planners in Sampleville identified eight work stations for an expanded facility—three in circulation (check-in/registration, check-out, book sorting); three in technical services (cataloging, typing, processing and mending); one for a future children's public service desk; and one for the director's office. Because Sampleville will likely be a smaller facility, planners also opted to apply the more generous space allocation for work stations. At 150 square feet per station, these eight stations require 1,200 square feet.

Step 4

Meeting Room Space

Many public libraries provide meeting rooms to accommodate library-sponsored programs and other community meetings. The number and size of meeting rooms should be determined by the library's anticipated programming activities and by the availability of similar rooms elsewhere in the community for use by other local groups.

There are four broad types of meeting room space commonly found in public libraries. General program space (with lecture hall or theatre seating), conference room space, and children's storytime space are found in many libraries, and increasingly libraries are choosing to provide dedicated space for a computer training lab.

Depending on the demands of its community, a library may have one or more general meeting or programming rooms. If the library provides no other space for meetings and programs, a general multi-purpose space will typically be the choice. In a smaller library, this kind of room can support general library programs, board and committee meetings, and children's storytimes. The desired audience capacity will determine much of the space need here.

Formula. In a general meeting room, a library should allow 10 square feet per audience seat, plus another 100 square feet for a speaker's podium / presentation area at the front of the room.

A conference room can alleviate the scheduling demands on the library's larger meeting room, freeing that room for other uses when the library board meets or another smaller group is scheduled to meet.

Formula. Assuming seating at a conference table, allow 30-square feet per seat. As a variation, allow 10 square feet per seat for any additional seating in a gallery or audience, if one is to be provided (if the conference room is used for board meetings, open meetings law requirements may obligate some kind of accommodation for an audience).

A storytime room likewise can alleviate the scheduling demands on the library's larger meeting room. Depending on the frequency of children's programming activities, a separate room for storytimes can be advantageous. A separate room creates a chance to locate the room *within* the children's library, close to the material that the programming activity is meant to promote. When it's designed, a storytime room can also be configured to support any "overflow" in the children's department during peak use hours.

Formula. In a storytime room, allow 10 square feet per child, plus another 50 square feet at the front of the room for the program leader. As a variation, note

that many children's programs include a craft activity, and if that is part of the library's plan of service, another 5 square feet per seat should be added to this allocation.

More and more libraries are setting aside dedicated space for a computer training lab for the public and staff. If the room is open for general use when there are no scheduled training sessions, it offers the advantage of expanding the number of computer work stations that are available to the public.

Formula. In a computer training lab, allow 50 square feet per station, plus another 80 square feet at the front of the room for the trainer (an allowance of 50 square feet reserves the option of seating two per station).

Example. In Sampleville, planners reviewed the library's programming activities and assessed the availability of other meeting facilities in the community. They determined that the library ought to provide a general meeting room to seat 75—this room would also double as the board room—and a separate children's storytime room to seat 25. The library's typical storytime program includes a craft activity, so planners use an allocation of 15 square feet per seat in the storytime room.

The area needed for the meeting room is 850 square feet (75 x 10, plus another 100 square feet for the speaker). The area needed for the storytime room is 300 square feet (25 x 15, plus another 50 square feet for the storyteller).

The total area needed for meeting and programming functions is 1,150 square feet.

Step 5

Special Use Space

Special use space must be allotted for elements of an individual library's program of service or for special types of furnishings that have not been accounted for in earlier sections of this outline. For example, none of the four types of library floor space described thus far includes an allocation for index tables, newspaper racks, pamphlet files, microfilm readers, or photocopiers. Small group study rooms represent another kind of special use space, as does a staff lounge or break room. More and more libraries are seeking to accommodate some kind of refreshment or beverage service, another use that falls under the heading of special use space. A server room, which is an increasingly important part of a library's day-to-day operational needs, can also be considered as part of special use space. Dedicated stations for self-check-out activities could also be considered as special use space.

Because of the interest expressed by more and more libraries to house features such as a refreshment corner or a library café or small group study rooms, special use space occupies a growing share of the overall, or gross area of a typical public library. At a minimum, special use space will likely occupy about 12% of the gross area of the library building. A moderate allocation will be in the range of 15% of the gross area of the building, while an optimum, generous allocation will be about 17% of the gross area of the building.

Planners should consider whether a minimum, moderate, or optimum allocation is most suitable.

A calculation in Step 7, "Putting It All Together," includes an allocation for special use space.

Step 6

Nonassignable Space

Nonassignable space is that portion of a building's floor space that cannot be applied or assigned directly to library service. Some representative types of nonassignable space are furnace rooms, janitor's closets, telecommunications closets, storage rooms, vestibules, corridors, stairwells, elevator shafts, and rest rooms. Such space is necessary to support the operation of the building, but it cannot be used directly for library service.

Nonassignable space generally comprises about 25 to 30 percent of the gross square footage of the finished building. A minimum allocation will represent 25% of the gross area of the building. A moderate allocation will represent about 27% of the gross area, while an optimum allocation will represent 30%.

Planners will need to determine what points within this range represent the best estimate of the library's space needs for nonassignable purposes. The final allocation of nonassignable space will depend on the efficiency of the library design, the size of the project, whether the project involves new construction or alterations of an existing building, and possible site constraints, among other factors. A smaller building is more likely to have a larger proportionate nonassignable space allocation. Projects that involve the expansion or adaptation of an existing structure are also more likely to have a larger proportionate nonassignable space allocation.

A calculation in the next section, "Putting It All Together," includes an allocation for nonassignable space.

Step 7

Putting It All Together

The space needs estimates developed in Step 1 through 4 for collection space, reader seating space, staff work space, and meeting room space can be added to derive a subtotal of four of the six kinds of space need.

Based on the allocations selected for special use space and nonassignable space (minimum, moderate, or optimum) a calculation is made to translate the subtotal into an estimate of the gross area needed for the building. If a library chooses to apply the minimum level for both special use space and nonassignable space, for instance, the combined allocation for these purposes will represent 37.5% of the gross area of the building. This means that the allocation for the remaining types of space – those calculated in Steps 1 through 4 – will constitute 62.5% of the building's area, and the gross area can be calculated by dividing the subtotal derived from Steps 1 through 4 by 62.5%.

Then add the estimates for each of the six types of library floor space to produce an estimate of the library's overall space needs.

Formula. To calculate an estimate of the recommended gross area of the building (GSF), start by adding the allocations derived for the first four types of space – collection space, reader seating space, staff work space, and meeting room space – to create a subtotal (S1). Then add the proportionate shares chosen for special use space (sp) and nonassignable space (no) and subtract the combined share from 100%. Divide the subtotal (S1) by that result.

Example. Library planners at Sampleville make a moderate allocation for special use space and a moderate allocation for nonassignable space. Their allocations for the first four types of space combined for a subtotal of 9,055 square feet (4,665 square feet for collections, 2,040 for reader seating, 1,200 for staff work space, and 1,150 for meeting facilities). A moderate allocation for special use space and for nonassignable space combine to represent 42.5% of the gross area of the building, which means that the subtotal of the first four types of space represents 57.5% of the gross area. The gross area of the building for the Sampleville Public Library is calculated by dividing 9,055 by 0.575 – roughly 15,750 square feet.

From this estimate of the gross area needed by the library, one can backtrack and calculate specific allocations for special use space and nonassignable space, although it is not necessary to do so since the bottom line estimate of the library's

space need is in hand. In Sampleville's case, if the gross area recommended for the building is 15,750 and special use space represents 15.0% of the gross area (a moderate allocation), then the allocation for special use space is about 2,360 square feet ($15,750 \times 0.15 = 2,362$) and the allocation for nonassignable space is about 4,335 square feet (15,750 square feet less 9,055 square feet in the subtotal, less 2,360 for special use space).

Finally, consider whether the library expects to make any further accommodations for services and functions that may not be sufficiently accounted for in these calculations.

For example, more and more libraries today are considering installing automated materials handling machines that receive returned materials, automatically discharge the returns, then mechanically sort the returns into a variety of bins or carts. Depending on the quantity of returns the library seeks to accommodate and how many categories and subdivisions the sorter will employ, these machines can occupy a considerable amount of floor space. Ordinarily, the allocation for this kind of device is considered special use space, and it's possible that a library applying this methodology might make a sufficient accommodation for such a materials handling system by adopting an "optimum" allocation for special use space. An alternative option for accommodating this type of use would be to add a specific line item for a materials handling system at the end of this estimate together with a specific estimate of space need (400 square feet? 750 square feet? more, depending on its scale and complexity?).

Another good example of this type of adaptation is the library that operates a bookmobile. The garage for the bookmobile would typically be classified as nonassignable space. Because a relatively small share of public libraries across the state and nationwide operate one or more bookmobiles, most libraries don't need to support a garage. Since a garage is not part of most libraries' general operations, the calculation of nonassignable space provided here does not fully allow for this use. Therefore, to accommodate a garage, planners could add a line item for that purpose at the end of the worksheet, along with a suitable allocation of space (the allocation would vary, depending on the type and number of vehicles to be stored).

Step 8

The Next Steps

This outline should be completed from time to time, as changing estimates of the community's population and demographics warrant, but no less frequently than every five years. Once the outline is completed, library planners will have an estimate of their library's overall space needs. Comparison of this estimate with the existing facility may highlight a significant deficiency in the space the library provides.

If this procedure documents a need for expanded space, the next step should be a closer examination of this space needs assessment. Re-examine and confirm the planning assumptions that went into the estimates. Are the population projections reasonable? Will the collection actually grow to the anticipated size? Should more seating be provided, or less? Are there sufficient work stations? And so on

The space needs assessment can also be refined through more narrow examination of the six broad types of space. This is done by

- identifying collections and service areas that were not fully or adequately discussed in the context of the outline;
- classifying the broad types of space discussed in the outline into functional groups and arrangements; and
- specifying the unique environments and conditions to be found in the library.

Start by filling in gaps in the outline by identifying collections or service areas that were not covered in the outline. Microformats are one example of a collection that's not addressed directly through the outline process. There may also be one or more unique collections at the library that are not captured through this process—the library may hold boxes of archival documents or a large photograph collection as part of a local history collection. These special holdings should be identified now and worked into the library's outline of space needs.

Next, classify these general space needs into departments. While the outline discusses six broad, generic types of library space, the library will not likely organize its entire collection into one area, or arrange all of its reader seating or staff work stations into a single space. A building will be organized around certain functional areas appropriate to the roles and mission of an individual library. Each such area or department will probably draw from two or more of the general types of space addressed in this outline. A reference department is likely to include some collection space, some reader seating space, some staff work space, and some special use space for index tables, atlas stands, and other unique furnishings.

The projected collection resource may be allocated among departments. Once that is done, a rough estimate of the corresponding space need can be made using an allocation of one square foot for every 10 volumes to house.

Example. Sampleville’s book collection was projected to grow to 35,250 volumes. After examining the library’s service programs and goals, planners decided that the collection should be divided into five areas. Moreover, they adjust their estimates of collection capacity per square foot, extending a moderate allocation of 13 volumes per square foot for the adult nonfiction and reference collections, but an optimum allocation of 10 volumes per square foot for adult fiction and the children’s collection (the better to accommodate increased marketing display of those collections). A sidebar: as a result of this refinement, the book collection now occupies 3,245 square feet – or 10.8 volumes per square foot.

Collection	Volumes	Sq.ft.
Adult nonfiction	10,500	805
Adult reference	1,500	115
Adult fiction	9,000	900
Children’s picture books	5,500	550
Children’s books	8,750	875
TOTAL	42,000	4,200

The other types of space can be subdivided as well—reader seating space, staff work space, special use space, and so on. At the end of this process, planners will have a space needs assessment organized around the library’s functional areas.

Finally, as the departmental categories are developed and omissions corrected, the space needs assessment can be further refined by noting the effect of the unique environments preferred in each department. Special shelving requirements can be noted and space allocations adjusted to reflect them. Remember that the minimum, moderate and optimum estimates cited here are predicated on certain assumptions. The actual number of volumes that can be housed per square foot will vary based on factors such as

- the height of a typical shelving unit and the number of shelves it can house;
- the length of a typical shelf and how much of each shelf should be used under ordinary circumstances—the “working capacity” of a shelf is between 65 percent and 80 percent of its actual length;
- the type of material being shelved—that is, how many volumes can typically be shelved per linear foot of shelf space; and
- how wide the aisles are and how big the base shelf is—both factors help determine how much floor space a representative shelving unit occupies.

These factors can change in different parts of a collection. Children’s material is often housed on lower shelves than adult material. Reference books usually are housed with fewer volumes per linear foot of shelving than other types of material. By considering these variations, planners can establish a much more accurate estimate of how many volumes per square foot can be housed in different parts of the collection.

Library planners should also remember that, for various parts of the collection, there will always be a portion out in circulation.

Example. Sampleville planners divided their library's 42,000 volumes into five broad segments. After examining circulation patterns, they determined a representative percentage in circulation for each segment of the collection.

Collection	Volumes	Pct circ	To house	Sq.ft.
Adult nonfiction	10,500	10%	9,450	725
Adult reference	1,500	0%	1,500	115
Adult fiction	9,000	15%	7,650	765
Children's picture books	5,500	15%	4,675	465
Children's books	8,750	10%	7,875	790
TOTAL	35,250		31,150	2,860

In a similar way, seating allocations in different departments can be examined more closely. Planners can determine how many seats should be provided at reading tables, how many at carrels, and how many in a lounge or browsing environment. The mix of table seating, carrel seating, and lounge seating will vary, depending on the library's service emphases and the atmosphere the planners are trying to create. After determining the best distribution of seating among typical seating environments, planners can multiply the number of seats at reading tables by 25 square feet, seats at study carrels by 30 square feet, and lounge seats by 40 square feet. This produces an even more accurate combined allocation for reader seating.

As the space needs are refined, planners should turn their attention to developing a written building program statement. Actually, by developing a space needs assessment to this level of detail, planners will have completed much of the work involved with writing a building program statement.

A building program statement is a written summary of library service goals, projected space needs, and a vision of how departments or service areas within a library should interact to achieve those goals effectively. It will describe a library's long-term space needs. It will identify the departments or service areas a library will require to accomplish its program of service, and it will describe what activities or routines will occur in each of those areas.

The building program statement will describe the necessary interrelationships among departments. It will describe other architectural requirements that planners wish to incorporate into an expanded facility, including general notes about lighting levels, accessibility, environmental controls, maintenance requirements, and so on. The architect will use a building program statement as a guide when developing plans for a library. The building program statement becomes a point of common reference between library planners and architect as they consider specific design options.

Wisconsin public library systems and the Division for Libraries, Technology and Community Learning may be able to provide support or assistance with the facilities planning process. Planners can also benefit from a review of the literature on library design and construction. A brief, selective bibliography can be found in Appendix A.

If this assessment demonstrates that an expansion project is recommended, library planners must be ready to embark on a most important mission—a building program. Few projects are as complex and rewarding as a building program, and few offer such an opportunity to shape a community’s library services for years to come. Local planners across the country have met this challenge time and again. With conscientious effort, every library building planning team can respond successfully to the unique needs of its community for a facility to house library collections and services adequately and effectively.

Appendix A:

Selected Bibliography

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Appendix B: Space Needs Worksheet

NOTE: An Excel workbook based on this worksheet can be downloaded from the Division's web site at pld.dpi.wi.gov/files/pld/xls/plspace.xls.