

The Soundscape of Twenty-First-Century Libraries

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Introduction

The library of the twenty-first century is not a nine-to-five operation. Instead, it is open all day and into the evening, often very late at night on college campuses, and more typically, every day of the week in a highly variable acoustical calendar. It houses a wide range of very diverse program uses, many involving the active engagement of users in both indoor and outdoor activities that provide a variety of communication experiences. The expanded uses bring with them a broadened taxonomy of sounds and expanded itineraries of heterogeneous individuals and groups of users.

In effect, the soundscape of twenty-first-century libraries is a design-based investigation into the rapidly evolving uses of the space. These include the media used in the library, architectural design strategies, and the acoustical attributes of libraries. Academic research and professional acoustical consulting practice in the design of vital soundscapes with multiple communication paths can have a significant impact on the design of successful libraries for communities, schools, institutions, and universities. Siebein (2013a,b) has defined five levels and seven elements of soundscapes that are pertinent to the design of libraries.

Five Levels of Soundscape Design

Siebein (2013b) identified five points in the design process that soundscape theories can inform the design of buildings.

- (1) The *inspiration* for a project occurs before any design actually begins. The inspiration is the underlying philosophy that guides the design and helps to set the framework within which the design occurs. Metaphors are often used by architects and soundscape designers to contribute underlying ideas to a project at its initial conception.
- (2) *Planning* is the larger scale design ideas that organize the experience of the building along a sequence of

spaces or “moments” where communication and interaction can occur in space and time.

- (3) A *conceptual structure* is the underlying set of principles and ultimately geometries that form the basis for the intellectual and formal aspects of the project. A conceptual structure is often derived from transformational mapping studies of a site and localized contextual influences such as sounds, weather, climate, social forces, circulation systems, traditions, historical influences, and spatial systems among others.
- (4) *Tectonics* are the elements that form the architectural system within which the soundscape occurs. The tectonic elements are arranged in a conceptual structure derived from relationships among the elements in a pattern or system that can be mapped in its physical or metaphysical dimensions. The tectonics are those elements that give a unique identity and form to a place.
- (5) *Details* are the local connections among the tectonic elements that support and express the inspiration and the conceptual structure of the project. The details are also the elements that often provide weather protection; connections among structural and enclosure systems; and elements that allow for sonic and other environmental flows in indoor environments.

Seven Elements of Soundscape Theory

Siebein (2013a) also identified seven elements in architectural soundscapes that can be applied to twenty-first-century libraries and the multitude of sonic activities that occur within them.

- (1) An *acoustical community* is a group of people linked by the importance of the communication they exchange, such as individuals, groups of students or people of all ages, ethnicities, abilities,

- and backgrounds interacting as they engage in the many other activities that occur in the “new” library.
- (2) Webs of *ecological relationships* connect the members of the community, such as the need to hear each other and also to be able to discern subtle meanings and cues from the sounds of others.
 - (3) *Acoustic calendars* or rhythms occur for each of the sound cycles and activity cycles for each of the participants that usually result in some variations of sounds and activities over a daily, monthly, yearly, or other cycle.
 - (4) *Acoustic rooms* are specific locations with localized sonic events that are uniquely colored or otherwise affected by the surroundings. In its simplest form, the acoustic room is literally a room with four walls, a floor, and a ceiling whose boundaries form the physical and sonic limits of the exchanges within it. The boundaries of the acoustic room are defined by the three-dimensional acoustical horizon of sounds and reflections that travel from one person to another and vary across the room.
 - (5) An *acoustic itinerary* is a path where the members of each community move, create, and listen to sounds during the course of their activities. There are multiple complex itineraries in twenty-first-century libraries. The communication that these sounds represent is one of the connective elements of a vital, functioning soundscape.
 - (6) *Sonic niches* are openings in space, volume, time, pitch, loudness, location, and rhythm arranged by the architect or soundscape designer so that sounds are heard alone or as a contributor to a larger soundscape. Soundscape analysis can be used to identify the types and structure of the niches so that the design can achieve compatibility with and enhancement of the aural exchanges in the spaces in the library.
 - (7) *Sonic flows* are sounds that occur within, between, and among acoustic rooms in the soundscape. The concept that soundscapes have somewhat permeable edges offers interesting design possibilities.

A Brief History

The media used in libraries has evolved with the development of technology. Early media were clay tablets, parchment or papyrus scrolls, and hand-copied books. Printed books and documents were the primary media in western libraries in the 1800s because the first

public libraries were built in the United States. Rare book sections for scholars were included in some larger libraries beginning in the 1800s through the 1900s. Aural recordings on records, tapes, and later CDs and DVDs have been added to library collections in the late twentieth and early twenty-first centuries. Internet access and computer workstations have led to further increasing the scope of program and media in library collections.

Libraries of Antiquity

Libraries are among the oldest of building types, with many dating back to ancient times. Libraries in the ancient world archived religious and government documents, preserved literature and important records, and served as a meeting place for scholars and philosophers. Some libraries were part of religious complexes, whereas others were administrative or governmental. Visiting scholars could come and read or copy manuscripts. Private libraries such as the Library of Aristotle have also existed since early times, whereas libraries for public use evolved later. These libraries would have rooms with collections of documents in various media and rooms in which the documents could be read. Some even had halls for discussion.

Traditional Libraries

Reading rooms have been an important part of libraries since antiquity. These are typically large, open spaces with higher ceilings and windows to allow daylight to illuminate the space. In early libraries associated with academic institutions, governments, or religious institutions, these were rooms where people could copy manuscripts, read books that were housed in the library, and contemplate or search for higher truths.

The acoustical intent or identity of the main reading room in the traditional library was conceived as a place for quiet, individual study and contemplation. The large, main reading room often had a tall, vaulted ceiling. The room was constructed with primarily sound-reflective materials so that if you moved your chair out, spoke quietly to the person next to you, or dropped your pencil on the floor, everyone in the space noticed. The sounds reflected from the place where the sound occurred to other locations.

The long reverberation time of the large volume, accentuated by focused sound reflections from domes or vaults, prolonged sounds made in the space so

that they could be heard by all in the room above the relatively quiet background sounds. Everyone in the room would know where the sound was made and who made the sound. Interestingly, quiet was achieved by the reverberant propagation and enhancement of sounds throughout the room because library users were careful to maintain the quiet soundscape. Traditional architectural acoustical references provide guidance for the analysis of reflected and reverberant sound paths and calculation methods to assess control of excessive loudness and acoustical defects in rooms (Sabine, 1964).

The Carnegie Libraries

The Carnegie libraries were built in the late 1800s and early 1900s in cities, towns, and universities in the United States and abroad to spread knowledge through reading to all citizens as part of Andrew Carnegie's legacy. Carnegie (see en.wikipedia.org/wiki/Andrew_Carnegie), who made his money by being a pioneer in the steel industry, donated funds to build the library if the community could provide a site to build the library on and provide funds for staff, operations, and on-going support.

Carnegie libraries were prototypes with a simple acoustical itinerary, straight forward plan, and efficient uses (**Figure 1**). The main entrance was often in the center of the facade of the building that faced the primary street. There was an entry foyer around which other spaces were oriented. A lecture room where people could exchange ideas and listen to talks about topics of interest was often included, sometimes located on a floor below the main or entry level and sometimes off to the side of the main spaces on the entry level. Back of house, staff work rooms, mechanical spaces, and bathrooms were also included on a lower level or to the sides of the main spaces.

The Carnegie libraries were often one large open, reverberant room built with sound reflective materials, sometimes with domed or vaulted ceilings with large windows to allow daylight into the spaces, similar to early library reading rooms. The librarian performed the role of central information and control where materials could be checked out manually by stamping a card in a pocket inside the cover of the book. The librarian also provided assistance to patrons verbally by helping them with questions about looking up information in the card catalogue. There were no real sonic niches for speaking to colleagues or friends or where conversations could occur



Figure 1. Reading room in a traditional Carnegie library, the Savannah East Henry Street Carnegie Library (Julian de Bruyn Kops, Architect).

about the library materials people were reading. People had to speak quietly, using their “library voices,” to avoid disturbing the quiet, individual study of others.

Periodicals and newspapers were sometimes located in separate areas where people could come in, read, and leave. People could even engage in a conversation with friends entering or leaving the space without disturbing others in the reading room involved in more serious study or contemplation if enough separation of these areas from the main reading room was provided.

Large, big city libraries in the early twentieth century often had a similar plan, organization, and itinerary to the smaller Carnegie libraries but on a larger scale.

Mid-Twentieth-Century Libraries

Libraries of the mid-twentieth-century often had similar plans to the precedent libraries, but new design trends were changing the shape, structure, materials, and soundscape of the libraries (**Figure 2**). Architecture of the mid-twentieth-century broke with earlier traditions and brought with it lower, horizontal lines that resulted in lower ceiling heights and more open spaces than the pre- and early modern architecture of the turn of the nineteenth century. The high vaulted ceilings were no longer a popular architectural motif. New materials such as acoustical ceiling tiles and other sound-absorbent finishes, including carpet on floors, replaced the stone, wood, and marble of the precedent



Figure 2. Photograph of main circulation desk, reading room, and stacks in a twentieth-century library, the Architecture and Fine Arts Library, University of Florida, Gainesville (Kemp Bunch Jackson, Architects, and Rudolph Weaver Campus, Architect).

buildings. Lower ceiling heights with sound-absorbent ceilings were often used in stack, catalog, and reading rooms. These design features resulted in a more subdued soundscape, thereby reducing reverberant and reflected sounds propagating across the room when people spoke, moved, or dropped their books.

Technology such as copy machines introduced a new mechanical sound in libraries. Sounds from other technical systems including microfiche, change machines, photographic stands, drinking fountains, air-conditioning systems, and public address systems, were added to the soundscape of the library as modernization occurred. Sometimes these machines were placed in separate rooms to limit the noise propagated into the main spaces and to control their use.

Other technical developments included the addition of sonic media such as audio books, CDs, and later DVDs to the collections. These media required audio and later video playback for people to listen and view the media. Sometimes this was done with people using headphones. Sometimes there were separate rooms where one or more persons could sit and listen to audio material or view and listen to video materials.

Late Twentieth-Century Libraries

In the later part of the twentieth century, architects began to raise the ceiling heights in libraries, often using angled rather than vaulted shapes made of gypsum

board, a sound-reflective material. When these high, angled ceilings were used in the main space over the circulation desk, for example, reflections off the angled ceiling surfaces propagated sounds into other areas of the library similar to the way that sounds from a stage in a performance hall or theater are reflected toward the rear of the audience seating area. This meant that sounds made in the part of the room under or near the angled ceiling would be reflected toward other parts of the library, possibly disturbing others using the space and causing excessive loudness.

Early Twenty-First-Century Libraries

At the beginning of the twenty-first century, architects began to use the shapes, volumes, and materials of the nineteenth-century library and put twenty-first-century functions and equipment into it, with new acoustical issues arising as a result. The use of a high, sound-reflective ceiling over collaborative work areas reflected sounds from one part of the large, open rooms to other parts of the rooms, meaning that one group of people could dominate the soundscape of a large area of the library, affecting other users who may not want to be participants in their soundscape.

Accordingly, acoustical improvements in soundscape design and analysis were needed to accommodate the new and evolving functions of the twenty-first-century library. Architects were designing large open-plan spaces that often had exposed structure and sound-reflective materials. Designers felt that the industrial aesthetic expressed a minimalist approach to design and a material functionality that was sustainable in some ways. There was little or no acoustical treatment in the spaces. Sonic niches were often not provided for special acoustical activities because it was thought the activities should be visually present in the main volume of the space to encourage participation. Hands-on activity areas were included for children where verbal and creative expressions were encouraged with little or no acoustical separation from other activities in the building. The acoustical horizon of the sounds from the children's activities would propagate through large portions of the space. Large numbers of computer workstations with Internet access were often included for individual or small-group use as research stations, card catalogue access, and reading media, some with audio capabilities in the main space of the library (Figure 3).



Figure 3. Photograph of twenty-first-century library, the Fruitville Library, Sarasota, FL (Hoyt, Architects), with open plan activity areas.

Audio Rooms

Audio listening rooms for individuals or groups, sometimes with walls but no ceilings, were provided for people to listen and view audio and video materials. Sounds would propagate out of the ceilings, walls, and doors of these rooms if they were not acoustically designed, entering the soundscape of the main room. More sophisticated printing, copying, and digital printing/fabricating technology that is being included in these rooms brings new sound sources from the equipment and processes as well as from the people using the equipment as they enthusiastically discuss the process and results of their activities.

Community Rooms

Community rooms where activities such as adult education classes, civic meetings, voting, and other social and community functions can occur are also often provided. These are not the lecture rooms of the nineteenth-century library where one person would stand at the front of the room and address a seated audience. These are multipurpose rooms where lectures, videos, multimedia presentations, and other formats are presented to a seated audience. They can also have more active workshops where multiple discussion groups involved in working out a community issue occur at the same time or where people may be working on a hands-on stained glass project. Sometimes these are stand-alone rooms outside the main library that may

be enclosed, semi-enclosed, or open to the main library space. In the latter instances, sound bleed from the main library space to the community room and vice versa can occur if the acoustical horizons of these sounds are not limited by reducing, buffering, or otherwise mitigating the sounds moving between the spaces.

Sonic Flow

Sometimes these sonic flows are deliberately designed as a part of the soundscape of the building to give one a preview of the activity in the community room and contribute to a sense of vitality and liveliness in the library. However, this is an area in need of research to help determine threshold levels for the interplay of sound flows between spaces. The threshold levels may encompass where the sense of activity and vitality is achieved or where the activities within the spaces are not disturbed due to the interplay of the different sound fields intersecting in unplanned ways. The soundscape concepts of reducing, buffering, and mitigating (Siebein et al., 2006) are understood in a colloquial way but are not precisely defined in terms of levels, content, meaning, perception, and value for different types of buildings.

Sometimes collaborative discussion areas are located in the middle of the main, open space. Audio listening rooms with 2.4 m (8 ft) tall walls and no ceilings were placed in a larger room volume with excessive sound bleed. Hands-on and exploration spaces are part of the main space. Sometimes these activities are separated from the main space in smaller rooms where break-out activities can occur with digital media playback and/or recording capabilities.

Recent libraries also include rooms for video conferences and in-person conferences for scheduled or impromptu use. When walls do not extend to the underside of the deck above or walls and ceilings are not used in these spaces, all sounds pour out everywhere and propagate through the spaces, especially when sound-absorbent finishes have not been integrated with the architectural design of the building. People engaged in quiet conversations or involved in individual study may find these sounds spreading from multiple sources through a large open space as potentially interfering with their own work and use of the space.

Social Gathering Spaces as Part of the Twenty-First-Century Library

Twenty-first-century libraries may also include large, social spaces with coffee shops, small restaurants, and dining spaces where informal discussions, social interaction with others, and individual study in a more relaxed atmosphere can occur. When these spaces are designed as atria, with high ceilings that are open at several levels to reading areas, stacks, and other spaces, sounds such as the barista making a latte or a conversation among a study group can propagate from the coffee shop on the ground floor up one or more stories into reading or study areas that are physically separated but sonically connected to the space below. Sometimes this sonic flow is viewed positively by staff and users and sometimes it is not. The sonic demarcation of this duality of perception of acoustic rooms within a larger space is an interesting topic for future research. If sound-absorbent finishes have not been integrated with the architectural design of the café or social/dining space, users may find the space to be too loud for even casual dining, reading, and socializing due to the large volume and sound-reflective surfaces.

Addition of Advanced Technology and Media Laboratories

The conversion of a 1970s library to a twenty-first-century library in the downtown area of a large city included the addition of an advanced technology center to the existing library. This included collaborative work areas; digital fabrication and hands-on spaces; and a complete semiprofessional audio recording studio, control room, isolation booth, video recording, and control along with editing bays to encourage use of the library by groups of people who might not otherwise use the facility. You could bring your garage band to the library and cut your digital recording in a studio and control room with state-of-the-art equipment.

The rooms were designed and built without professional acoustical consultants on the design team. As a result, there were significant sound bleed issues between the audio and video studios and the main reading room. Sounds from the maker space also entered the adjacent video recording space and audio recording spaces across the hall.

There were no sound locks at the entries to the studios, just weather-stripping “acoustical” seals on the doors, open transfer ducts between spaces for return air, unsealed penetrations for pipes and conduits, and walls that did not provide adequate sound reduction so that sounds from studio sessions poured out into the main space and the video studio and vice versa. Needless to say, there was a lot of work to sonically renovate the renovation.

Consciously Designing the Soundscape of the Twenty-First-Century Library

The acoustical design of a consciously designed soundscape in a building with a complex program with multiple uses and types (taxonomy) of sounds should ideally begin with the initial architectural ideas for the building, at the inspiration and planning stages of design, so that sonic concepts are seamlessly integrated with the emerging architectural concepts and budgets for the spaces. A case study is used to illustrate the process of integrated soundscape and architectural design in a twenty-first-century library. This is based on the library of the Ringling College of Art and Design in Sarasota, FL (see www.ringling.edu/library).

The large central space of the library explodes three-dimensionally to organize the building (**Figure 4**). It is an active, engaging space intended for social interaction and orientation of people to the many activities in the building. Acoustical finish materials were integrated at each of the three levels of the space that is centered around a monumental stair to organize circulation and wayfinding as well as to control the propagation of sounds from one floor to another. A sonic niche was created for the main service desk that is located just off this space with a lower ceiling, and acoustical finishes added to reduce the propagation of sounds to staff at the desk and to allow for intelligible communication between students and staff at this important location (**Figure 5**).

The coffee shop in the library was also designed as a sonic niche for active conversations by locating it in an area off the main entry space where it is visible, but where the ceiling height decreases, acoustical finishes are used, and the baristas are set back from the atrium organizing space to reduce the propagation of sounds through the main room volume.



Figure 4. Main entry/circulation space in twenty-first-century library, the Alfred R. Goldstein Library, Ringling College of Art and Design, Sarasota, FL (Shepley Bullfinch, Architects). The photograph shows a unique view of the underside of the stair (black angled shape) looking upward in the main space that has been deliberately foreshortened to create the abstract pattern shown. The concentric rectangular openings in the upper floors are penetrated by the stair as it moves upward through the space. The round lights (skylights) are on the upper ceiling of the space. Looking closely, you can see the underside of the ceilings with acoustical ceiling tiles visible around the perimeter of the central space of two floors above the ground floor. The dynamics of this central space make it a vibrant accent to visually orient people to the library.

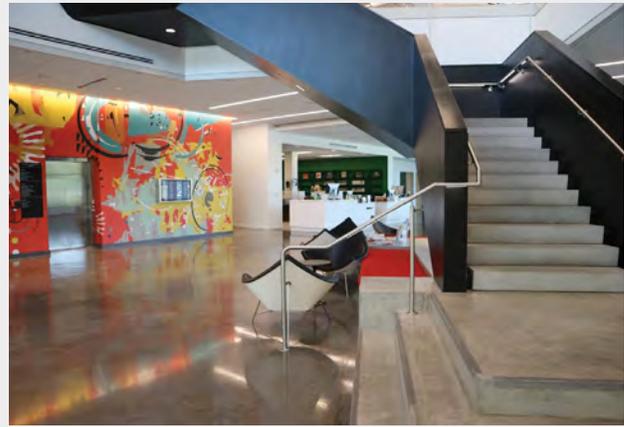


Figure 5. View of central stair from the side with an acoustical niche that allows quiet, clear conversation at the main circulation desk with a lower sound absorbent ceiling just off the main space at the Alfred R. Goldstein Library, Ringling College of Art and Design, Sarasota, FL (Shepley Bullfinch, Architects). The circulation desk is tucked in a lower ceiling space under the stair in the center of the photograph. The elevator is located on the left side of the photograph in the exhibit wall. The main circulation space is oriented vertically in the building that the stair (i.e., the means of people to circulate vertically) occupies. The major library functions are connected to the main circulation space at each level. The black walls of the stair railing bend up and to the side of the image as the stair moves upward through the large opening in the second floor near the top of the image. The stair continues up to the third floor, beyond the top of the photograph.

There is an exhibit space on the first floor that serves as a vibrant backdrop for social activities. Sounds from the exhibit space propagating to the other spaces around the central core are controlled through the use of subtle, integrated acoustical finishes.

There are also two multipurpose rooms on the first floor that are used for a variety of classroom activities, meetings, guest lectures, performances, and other activities, with multimedia intensive audio and video systems that can produce high sound levels for student film, video, and art installation showings. The rooms have moveable furniture so that flexible furniture arrangements can be configured for the different uses. Special sonic niches were created for the unique requirements of these rooms as closed acoustical systems. Special sound isolation systems were included for the walls, doors, and floor/ceiling assembly

above to limit sound bleed out of the rooms during aural media events to adjacent spaces. Special acoustical finish systems were also used to control the reflected and reverberant sounds and to optimize the sound field in the room for all listeners based on the types, locations, and aiming of the audiovisual system loudspeakers.

Similar sonic niches were also created on each floor for group study, for multimedia development and viewing rooms, for collaborative work on projects, and as audio listening rooms. Sound-isolating wall, door, and floor/ceiling assemblies are used so that higher sound levels can be played while developing and/or listening to aural media of different types and sound bleed into the main spaces is minimized. Interior acoustical finishes tuned to the loudspeaker playback systems optimize the listening environment to provide clear, intelligible communication



Figure 6. Open plan work area with flexible furniture for individual and group work in a twenty-first-century library, Alfred R. Goldstein Library, Ringling College of Art and Design, Sarasota, FL (Shepley Bullfinch, Architects). It is located off the main vertical circulation space in an area with a lower, sound-absorbent ceiling to create a smaller acoustical room within the larger space.

for those inside the room and for those who may be listening remotely via video conference via different platforms (Figure 6).

There is a learning commons on each of the first two floors that is a flexible space that can be reconfigured for different teaching and working modalities. Sonic niches for active learning involving fabrication, collaborative discussion, and other formats use distance, absorbent materials, and zoning to create transitions to adjacent uses to limit sound bleed into and out of the spaces to the extent possible.

The dynamic interior soundscape extends outdoors at each level where reading and study areas are shaded and covered at each level. This allows the exterior soundscape to interact with the interior soundscape during the mild Florida climate for many months of the year.

The stacks and reading areas are still essential parts of the library so that sonic niches for individual reading and study are included within the larger spaces. These include furniture designed to form an acoustical space that can be inhabited by a person and blocks sounds coming from the sides and rear, absorbent finishes on the ceiling, and carpeted floor, with distance and transparent glass walls separating more private areas from more public areas (Figure 7).

Special collections including rare books, map rooms, document libraries, archives, advanced research areas, and back of house spaces were given their own acoustic rooms, with solid and glazed walls separating them

from the main public spaces so that a relatively quiet environment was achieved. Acoustical finishes were included in the rooms to allow quiet study for individuals using the rooms.

Future Directions

Future directions could include quantitative and qualitative research on how acoustical buffers and transitions are perceived for different specific acoustic events and communication scenarios that occur in the library. Explorations of how the impulse response and quantitative acoustical metrics are related as one creates acoustical niches within larger spaces and how multiple acoustical rooms can be developed within a larger architectural room to achieve a balance between fostering collaborations and group exploration using a variety of aural media while allowing space for one to study and find a place of quiet would be helpful in this and many other evolving building types. Continued efforts at pre- and postoccupancy evaluations of the buildings using focus group discussions, interviews, questionnaires, and other qualitative research methods should be encouraged. Organized acoustical measurements using directional sound sources similar to actual speech and media propagation to identify specific communication paths and acoustical commissioning that addresses these issues should become more widely understood and standardized.

Conclusions

The large, open spaces with multiple uses of the library of the twenty-first century require acoustical design

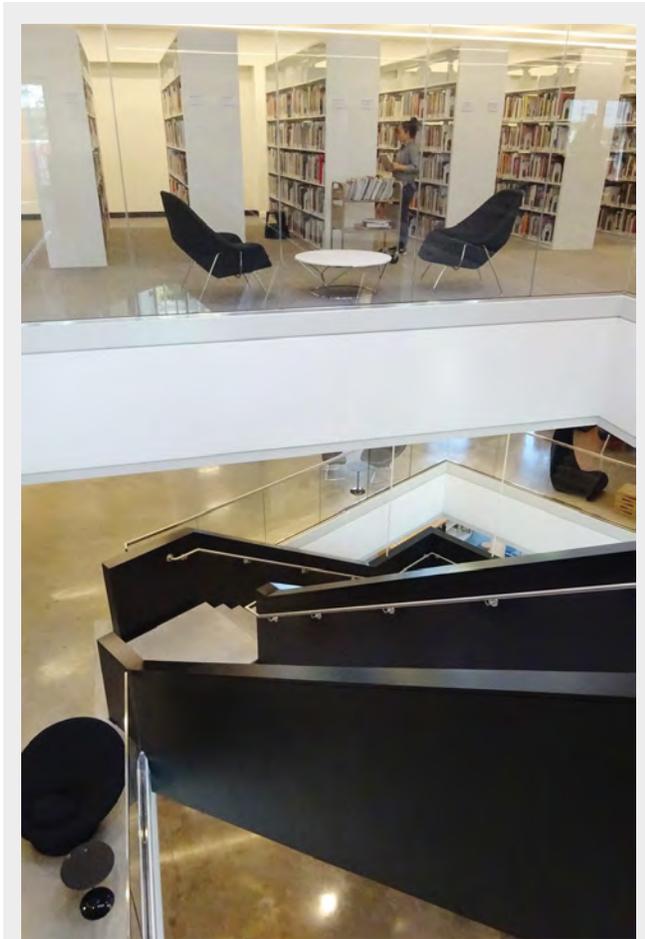


Figure 7. Sonic niche in twenty-first-century library, the Alfred R. Goldstein Library, Ringling College of Art and Design, Sarasota, FL (Shepley Bullfinch, Architects). The niche is a much smaller “acoustical space” between the two chairs in the top one-third of the photograph. The photograph shows that the scale of a niche can be intimate compared with the larger size of the main space. The glass wall separates the niche from the large central organizing space. This wall reduces sounds traveling into the niche from other parts of the library. The niche allows for one to read in relative quiet in the middle of an active space or for two people to engage in discussion without acoustically involving the rest of the large open space.

for the spaces to be fully functional for expanded uses. Designing the soundscape often involves reducing, buffering, and mitigating sounds traveling from one area of the large spaces to another, creating acoustical niches and/or acoustical rooms within a larger room volume (Siebein et al., 2006). Acoustical design of these complex spaces must be fully integrated with architectural design

using a full palette of soundscape design strategies to achieve suitable results. These could include acoustical collaboration with the architect in each of the five levels of soundscape design: inspiration, planning, conceptual structure, tectonics, and details.

In other words, ideas about how distance, acoustical finishes, furniture, and partial height partitions as well as traditional walls and doors, varying ceiling heights, and finishes can be used to create buffers and filters to reduce sound flows between spaces. Sonic niches can be carved out of larger spaces for selected spaces for individual and special purpose uses within the larger building during the planning stage. Sonic niches become spaces where desired communication and/or sounds are made and relatively contained in the niche area.

As a consequence, the library of today has been transformed into an active and engaging soundscape for all users. What a dynamic, evolving, and challenging building type on which to work that is truly changing the way that cultures study and reflect on themselves. Who would have thought that recording studios, film screenings, rare books, archives, individual or group reading of traditional books, Internet use, community gatherings, fabrication of digital artifacts, classes of various types, and other activities would be a part of the library as it moves into the future.

Societies and cultures are continually redefining the acoustical and architectural identities of the twenty-first-century library. This dynamic situation is pushing acoustical analysis, design, and practice into new areas as possibilities for reconciling what were previously thought to be incompatible activities are understood. This is how soundscape design can become the inspiration for architects, interior designers, and those building libraries who are seeking to push the state-of-the-art in the expansion of thought and inspiration of creativity and to strengthen of the structure of community that are the foundations of healthy and urbane cultures.

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LIBRARY SOUNDSCAPE

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