Non-Visual Aesthetics

Student Recreation Center for Ball State University

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ABSTRACT

The goal of this thesis book is to summarize the information gathered during a year long study of architecture that meets the needs of the handicapped. The study dealt primarily with the blind. Included are both a list of social, psychological and physical needs of the blind and some suggestions as to how they can be met.
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PART I: PROBLEM IDENTIFICATION

INTRODUCTION

This thesis is a result of a growing, personal concern about the how Architects have met the needs of accessibility for the handicapped, the blind in particular.

Most people include only people in wheelchairs in their definition of a handicapped individual. Given only this small portion of the total handicapped population, the design solutions remain far below an acceptable standard. Recently, activist groups have demanded that they be allowed access to public buildings. This has improved conditions somewhat for those in wheelchairs. However, there remain many unmet needs. Some of the more glaring problems are listed here:

1. Because the handicapped represent a minority, their needs are often pushed aside as unimportant. Even though most people suffer at least temporary handicap sometime in their lives and will probably become handicapped in some way as they grow old.

2. Segregation of the handicapped by forcing them to use secondary, side entrances and specially designated areas focuses society's attention on their differences.

3. Their disability is seen as an inability to function in society.

4. People are afraid to discuss the needs of the handicapped because they think they will offend them.

5. Stereotypes are created about the handicapped which isolate them further from society.

If these obstacles seem formidable, the problems of the blind are worse.

1. The blind are not even included on the list of special users.

2. Their apparent confusion and stumbling frightens many people.

3. People who have been blind since birth lack most normal face and hand gestures. This is seen by many as a mental deficiency.

4. Low vision people, who are not obviously blind (i.e. don't use a cane or a dog) are thought to be illiterate or stupid because they are unable to see the normal visual clues of orientation.

5. Blind people who walk with a sighted guide of the same sex are called gay.

6. Many adaptations done for the wheelchairs, such as no curbs at the street, can be life threatening to the blind.

7. Extremely loud sounds can render the blind unable to move. This is of great importance in a fire; the alarm is so loud that the blind are unable to determine any other acoustic clues used in orientation.

8. Their only clue to the whole picture of a large object is small pieces.

9. Their memory must be flawless and very large in order to accurately retrace their steps or to locate new places. One mistake, one missed turn and they may become hopelessly lost.

10. Once lost, it is nearly impossible to find their way without assistance.

11. Their inexperience with the sighted world makes communication about aesthetics in general very difficult.

12. Most blind people compensate for their impaired ability communicate about aesthetics by speaking only about their functional needs.

13. If the needs of the blind are considered at all, it is only their needs which affect their safety which are designed for. Most social and psychological needs are not mentioned.

These are a sample of some of the problems facing blind people today. It is extremely rare that any of these problems are addressed, much less solved effectively.
SPECIFIC ARCHITECTURAL ISSUES

The three key issues facing architects are:
1. How to educate the blind as to their right to
demand better architecture
2. How to elevate
the architect's awareness of these social,
psychological and aesthetic needs of the
handicapped as well as their functional needs.
3. How to integrate the needs of the various
types of handicaps with other design issues.

Why should architects be concerned with
these issues? There are three reasons for this.
The first is that at the present, the blind have
not been included in the architect's program.
Their needs are not being considered as part of
the design process. If the blind are shown
what they are missing, they will demand that
their needs be met. Secondly, Architecture has
a lot to learn from the blind and how they
perceive their environment. Many blind people
are sensitive to subtle changes in texture and
sound. Although sighted people may not be aware
of them, these changes do affect their
perception of space. Blind people can be a
valuable resource to us in understanding these
subtleties. Lastly, the need to integrate all of
the design issues - those concerning the
handicapped as well as conventional issues - will
make the building more homogeneous rather than a
hodgepodge of parts. Furthermore, it is easier
to consider all the related issues at the same
time. This is an overview of why these three
issues need to be addressed by architects.

QUESTIONS TO BE ADDRESSED BY THE THESIS

1. What makes a building accessible and usable
to blind people? What are their functional
needs? What kind of information do they utilize
in their environment?
2. What environmental stimulants to their
remaining senses can be included in a design to
communicate the intended quality and function of
a space? What spatial, textural, and sensory
qualities in addition to sight, can communicate
a room's function?
3. What can architecture do to enhance blind
people's appreciation of space? How, exactly,
can the architect create and enjoyable
experience for the non-sighted? What is the
right combination of texture, volume, smell and
sound?
4. What are the conflicts between non-ambulatory
and blind accessibility and the ablebodied
person's needs? What are the common elements,
and how can they be combined successfully?

THESIS STATEMENT

The handicapped user, the blind in
particular, have a great deal to offer
architecture. At present, the only information
available on design for the handicapped, is a
list of spaceal dimensions (such as ramp slopes,
curb heights etc.). These have ignored the
social psychological and aesthetic needs of the
people and underestimated the creativity of
designers. What is needed is a list of goals
that give general qualitative recommendations
rather than quantitative rules. Be eliminating
the code books for handicapped design,
architects should find more creative ways to
integrate the perceptions and needs of the
impaired individual.

Architecture that considers how blind
people perceive their environment is more
interesting, more functional, and more
comfortable to be in than a building designed
for visual aesthetics alone. An understanding
of this kind of architecture will give everyone -
both handicapped and able-bodied - the kind of
architecture they deserve.
PART II PROCESS: A WAY OF ADDRESSING THESE ISSUES

EDUCATION

There is a real need for educating the blind about architecture. I have found that, while some of the totally blind students I worked with on this thesis did develop a slightly better appreciation of architecture, they still generally lack a true understanding of their built environment. They are very sensitive to acoustic variations but only in how this affects their mobility, not how they evoke feelings. It may be possible to teach adults who have been blind since birth to better appreciate architecture, because on the whole, they are very curious about the sighted world. But as children, they would benefit from learning that their world is considerably larger than what they feel within arms reach. Many blind children I have met are unable to see bits and pieces of their surroundings as an entire environment. If, through models and tours, they were exposed to a variety of experiences in spaceal perception, they might become more aware of their environments and of what they have a right to expect from designers than they would be better able to express their perceptions.

AWARENESS

The best way to truly appreciate how a blind person perceives his environment is to spend a great deal of time with him. Day to day experiences are the best teachers. However, if this is not possible, the next best thing is to experiment by blind-folding yourself. Try to determine the shape and size of the space around you. With practice you should be able to come close to estimating the height of the ceiling, and your proximity to the walls. You may even be able to guess at some of the textures present without touching them, just by their acoustic quality.

Similar exercises in how the blind use clues in the environment are: either to talk with several blind people (each person may have a different system) or to try navigating a sequence of spaces. It would be worth your while to find out how the long-cane is used before trying this, it could be dangerous. As you walk, look specifically for things that tell you which way you are travelling, warning signs, the change in sound as you go from a large room, through a small door into a tiny space, than outside.

These experiments should, at the very least demonstrate that the need for specific design elements is real, not simply a nice idea. You will better appreciate how difficult it can be to navigate a poorly designed space. At best, you will discover how rich your environment can be even without sight. Lack of sight often encourages people to be more aware of their other senses, which is important in designing a wholeistic architecture.

INTEGRATION

The basic way to integrate these various needs of the handicapped and those of the general population is to see what some of them have in common. For example: sighted, blind, and those in wheelchairs all need to have some system to tell them where they are and where they are going. Of these three users, the blind are the most demanding. If you design an orientation system that they can understand, then it follows that the others will also be able to use it. Likewise, where level changes are concerned, those in wheelchairs require the greatest consideration. Blind and ablebodied people will be able to use the ramp/elevator
system without difficulty. The challenge begins when their are no commonalities, then some sort of compromise must be reached.

DESIGN CONSIDERATIONS

The following is a summary of some basic design considerations for the handicapped. They are divided into three groups: orientation, boundaries, and warning systems.

ORIENTATION

Floor plan Their primary method of locating specific areas relay solely on memory. Blind people, almost without exception, never make their first visit to an unfamiliar place without a sighted guide. When travelling alone (this is also true for people using guide dogs) the person must rely on his ability to recall a specific sequence of landmarks and clues. Because of this, a relatively simple floor plan helps. They are able to create a map of the buildings in their mind and use it to find their way. If the building is maze-like, cognitive mapping of this kind will be extremely difficult.

Landmarks Landmarks that are unique from their surroundings and detectable by sound or floor texture are imperative. A few examples would be fountains, temperature change (sun to shade), tile to carpet change, a bakery, cobblestones etc. Acoustic clues that are detectable from a distance are very helpful for people who have become lost. However, if the clue is to be loud enough to be heard from a distance, the designer must be careful that when it is approached, it doesn't obscure all other sounds.

Texture Floor texture, when used as a path, should lead the person to some specific location such as the entrance. Also, the floor texture should not be too rough. Very rough flooring tends to catch the tip of the can and the person has to continually stop and lift the cane out of the hole, this is exhausting. Grass is an example of a difficult texture to use a cane on.

Corners The ideal angle (specifically for walls) is 90 degrees. If the inside angle is greater than 90, the blind become confused as to whether or not it actually is a corner. They often assume that they have veered from a straight path. The reason for this is the distinct change in sound between walking beside a wall and then, if it is a 90 degree corner, suddenly not being beside it. In contrast with this is an exterior angle of 45. If the blind person is following the wall to the corner, he keeps himself at approximately 3 feet from the wall. This is to avoid people who may be entering or standing by the wall or doors that unexpectedly swing out. When he reaches the corner and the wall begins to get farther from him, but it a still reflects some sound. So it is unclear as to whether or not it is a corner.

Entrances The easiest arrangement of air-lock doors and path is for the doors to be lined up one directly in front of the other, leading directly in the same direction as the path. If the two doors are at an angle to one another, the blind person must make several turns. These turns must be remembered in order to reconstruct the direction he is facing once inside the door. Likewise, if the pathway is not directly in front of the door, for example, it is parallel to the entrance, than he must remember considerably more than if the path is obvious.
Entrances located at the corner of a building are easier to find because there is only a small area to search. If, for example, you know the entrance is in the middle of the building, you must then search along an entire side for the doors. Also, there is the advantage of being able to detect the corner much easier than the middle of a wall.

BOUNDARIES

Edges The best edge definer for a path, particularly between the sidewalk and grass, is a low curb. This helps keep the blind person's cane from getting tangled in the pant material. However, this can be hazardous for people on bicycles.
WARNING SYSTEMS

The blind use only the floor, and their hearing for warnings. Wall textures, etc. will not be used. This means that if there is an overhanging or protruding object, it must have some sort of warning that is detectable on the floor.

handicapped to move along the path without forcing their way and calling attention to themselves.
6. There will be a simple sequence of landmarks leading to the major public spaces of the building.
7. All pathways should be safe from unexpected level changes.
8. Pathways should lead to some recognizable place.
9. Corners at major intersections that have paths along them, should be 90 degrees or less.
10. Textures that are intended as a coding system must consistently mean the same thing.
11. The walls in waiting areas should have something interesting on them to touch. This is because most blind people enjoy investigating their surroundings when they have time to do so, and the walls which they are leaning up against are the first place they will look.
12. Landscaping should follow these same rules. Also, the totally blind user will usually not venture onto the grass more than a few feet for fear of getting lost in an area without landmarks.
13. Parking lots should have some sort of directional device in it. Blind people notoriously get hopelessly lost in seas of concrete.

DESIGN CRITERIA:
1. Complete integration of all accessibility aids for the handicapped into the main flow of activities.
2. All entrances to be accessible to all its users.
3. Entrances at the corner should have parallel doors and lead directly to the pathway.
4. There should not be any overhanging obstructions.
5. The pathways should be wide enough so that they aren't congested. This allows the
PART III SOLUTIONS

INTEGRATION

The integration of accessibility aids requires consideration of each specific problem individually. However, the following are suggestions as to how a few of them were solved.

Direction of travel and level changes: The need to communicate to the blind which direction they are going when they enter the main path from a side area has been combined with a ramp that allows wheelchairs to negotiate level changes along the same hallway as ablebodied people. When the blind person leaves a shop and wants to know which way McKinley and Petty is, he simply walks up the ramp. Regardless of which ramp he is on, they both lead to the main entrance. If he requires further definition of where he is, all three ramps are at different slopes. My research has shown that a slope of 1:50 is detectable by blind students. If the ramp is not specifically for making a level change, than a shallow slope is recommended so as not to tire those in manual wheelchairs.

The edge of a pool: The edge of a swimming pool provides many areas of conflict between all the handicapped and the ablebodied person's needs. There is the problem of how to provide access to the water for those in wheelchairs. How can you warn the blind that they are near the edge of the water (they do not bring their dogs or canes to the pool)? I discovered a raised edge/bench works the best. This allows people in wheelchairs to transfer to the bench as they would to any chair. They aren't as conspicuous as when there is a sling hoist or when they are wheeled down a ramp and in to the water. Once in the water there is a seat for those who can't swim to sit on. This seat is also nice for ablebodied people who want to sit
and talk in the water. This edge also prevents blind people from falling into the water. Several blind students expressed terror at the idea of falling like this, apparently, several blind people have panicked and drowned in this way. This ledge does present one hazard to the blind: they will probably hit their shins on it. In addition to the raised bench, a floor texture denoting a safe path around the pool is helpful to the blind. The pool can also give a clue to the blind as to which way the lockerrooms are, or the office, or he first-aid etc. One way of doing this is to have a specific corner pointing towards the way, a side or even some acoustic clue will work just as well. I would like to note that none of these accessibility devices are obtrusive to visual aesthetics or the ablebodied person's use of the pool.

ACCESSIBLE ENTRANCES

All of the entrances should be approached by wheelchairs in the same way that the blind and ablebodied person enters. If a monumental flight of stairs is used, a wide, ramp could be implied as the main path. Leaving the stairs for people to sit on. This would be challenging. An easier way to integrate accessibility would be a shallow slope or a level approach. The goal here is not to segregate the handicapped from the rest of the users.

Once at the doors, they should face the approach so that the blind don't have to search for them. Remember that the airlock should consist of parallel doors leading directly in the line of traffic.

OVERHANGING OR PROJECTING HAZARDS

Recall that the floor is a blind person's only source of warnings. If you design a cantalevered overhang, that is approachable it should have some warning on the floor. By placing a planter or a bench or even a low curb under the hazard, you will save many blind people a great number of head injuries.

WIDE PATHWAYS

By widening the hallway you alleviate congested walkways. This helps the handicapped person because he doesn't have to create a fuss in order to get through the traffic. It helps the rest of the users because it's more pleasant.

LANDMARKS

Some of the landmarks used in my project are fountains. I chose these because they have a distinct sound that can usually be heard from a distance. They also create a relaxing atmosphere for the space. All three fountains are unique from each other in sound and appearance. This is, again so that the blind won't mistake one for the other and get disoriented. The fountains are located at key places: inside one entrance, at the junction of the ramps and at a major intersection.

The fountain where the ramps meet serves two purposes. It creates white noise for the seating area on the main level, and it allows blind users to focus on their desired destination—the ramps. From the entrance at McKinley and Petty, the person will proceed forward straight from the doors. If along the way he begins to deviate from the path, he should be able to hear the waterfall and make a straight line towards it.

The fountain at the intersecting paths was placed there as an obvious acoustic clue to use in determining which path to take. At this intersection, each corner is unique: one has the fountain, another the beer garden (also and acoustic clue), and the others have planters—
one with fragrant flowers and the other with bushy trees that cast sound shadows and are easily recognizable by the blind. The way that these would be used is that the person would remember that he should pass between the beer garden to go the the pool, and between the fountain and the beer garden to continue on towards the ice rink. This is a rather elaborate way to give directions. If the intersection is a simple four-way junction than only one corner needs to be different or perhaps it is obvious without any clues.

PATHS LEADING TO SPECIFIC PLACES

Ideally, all of the paths should lead either to an entrance or to some recognizable place. In this way, if the person gets lost, he only has to walk a ways and he will be lead to a familiar place. This could prove extremely difficult to achieve in an office complex. My only thought on the subject would be to keep the plan as straight forward as possible and create several landmarks.

CONSISTENT SYMBOLOGY

The American National Standards Institute (ANSI) has recommended that knurled door knobs meant warning to the blind. I discovered that none of the people I talk to had even guessed that this was intended to communicate warning to them. In general, as long as the symbols always stand for the same thing, the blind will recognize them.

Some of the symbols that Ball State's blind population felt were reasonable were as follows. Carpet usually meant either quiet place or movable furniture. Smooth walking surface meant main path while textured floors meant something unusual. One instance of this was at an Indianapolis shopping mall. There were numerous small columns scattered throughout the main atrium. The column's center lines were highlighted by brick flooring. So, if a blind person felt the brick, he knew he had to be careful of columns.

One word of caution about floor colors. People with low vision often mistake dark patches on the walking surface as a level change. While some contrast is helpful and interesting to look at, sharp contrasts of light to dark should be considered carefully before implementing.

WALL SCULPTURE

The use of wall sculptures and textured murals can add another level of interest for the blind as well as the sighted. The best place to locate these is where the blind tend to wait for other people. Blind people will usually take the first opportune place to wait. For example, just inside an entrance, or at an obvious landmark. If you use large pieces of art, be careful that they are not so big that the blind can't reach the top of them or that the figures are so large that the whole can't be interpreted by its parts.

PARKING LOTS

Parking lots present a real challenge for designers. An orderly pattern of detectable elements, such as trees, that point towards a recognizable place is one way to give the blind some direction. However, I have not yet found an ideal solution to this problem.
PART IV ADDITIONAL CONSIDERATIONS

As previously mentioned, one area that bears further investigation is education for the blind, the children in particular. Just how this is to be done I'm not sure. One idea is of course models. While interviewing students I discovered that they really enjoy looking at models. Not only of buildings but of any large object. I used a model to show one student how an interchange on the freeway worked. He said that he had often wondered how the cars entered and exited at such high speeds. I think that the blind children should be exposed to such things at an early age so that they will better be able to communicate with the sighted. Such simple things that we take for granted are not understood by the blind.

Likewise, the deaf are excluded from many designs. Because their handicap is not obvious, they are usually not included as special users with specific needs. This is another area that needs to be studied.

The architect has so many things to consider as he designs a building that it seems cruel to add the needs of the handicapped to his burden. However, their needs must be included in the program. And as has been shown, they can often create richer environments for all the users.