

BUILDING SIGHT - DESIGN FOR ALL

Synopsis

Over the last thirty years there has emerged a growing awareness that good design - whether of buildings, interiors or streets should be in nature inclusive. Creating accessibility for all people - " The elderly and persons with disability" ensures their ongoing vitality and to meet the expectations and needs of the community to which they belong and serve. The presentation will focus on key considerations to be borne in mind in the design and development of buildings, building services, lighting, layout and signage and information for person with disability with special focus to the persons who are vision impaired.

Creating accessibility for all people - " The elderly and persons with disability" ensures their ongoing vitality and enables them to meet the expectations and needs of the community to which they belong and serve". For this to happen we are to move towards the Inclusive Design approach that sets to include as many people as possible. Inclusive design does not look for the lowest common denominator. It is not an attempt to reconcile the often-conflicting needs of every possible minority group in the society. "Inclusive Design" - by considering various needs, merely attempts to breakdown needless barriers and exclusion.

Singapore Association of Visually Handicapped (SAVH) as a part of the working committee on Barrier Free Code has endeavored to make recommendations that address the needs of not only the needs of persons with vision impairment and the elderly. The popular image of a blind person is of someone who is young, totally blind, reads Braille, is musical, happy and has bionic hearing. However reality is somewhat different - persons with vision impairment do not belong to a homogenous group and have very varied needs and aspirations.

Only five percent of those who are vision impaired do not have any sight at all. The rest of them will have varying degrees of sight, which will enable them to function visually to varying degrees. The nature of visual handicap can vary considerably among individuals and that may make the overall picture appear to be complex and in terms of design recommendations, sometimes can be contradictory In general various eye conditions will lead to following types of impairment: -

- ❖ Central Vision Loss;
- ❖ Peripheral Vision Loss
- ❖ Overall Blurring

Most vision impairment is acquired late in life. About 2 percent are under the age of 16, 10 percent under the age of 59 and 88 percent are over 60 years and above (Royal National Institute for the Blind, Scientific Research Unit). Over the next 2-3 decades there will be an increase in the number of people over the retirement age and an increase in the expectation concerning quality of life. Many of the conditions which cause loss of vision are age related and it is therefore reasonable to anticipate that the proportion of blind or partially sighted people in the total population will increase progressively over the next few years.

NUMBER AND PROPORTION OF ELDERLY

	1999	2010	2020	2030
Number of Elderly Aged 65 +	235,000	312,000	529,000	796,000
Proportion of Elderly Aged 65 +				
Median Age (years)	7.3	8.4	13.1	18.9
Dependency Ratio	33.4	36.9	39.3	41.2
Young (0-14)	42.0	38.7	44.9	56.4
Old (65+)	31.7	27.1	25.9	26.9
	10.4	11.6	19.0	29.5

(Source- Report of the inter-ministerial committee on the ageing population 1999-Singapore)

Singapore will have a greying population in the next 30 years. We have about 235,000 elderly aged 65 and above (or 7 percent of population) 1999, and this will increase to 796,000 (or 19 percent of population) by the year 2030. Over the next 20 to 30 years we will see a significant demographic shift. There is a large degree of overlap between the elderly and disabled people and approximately two thirds of disabled people are elderly. Making environments for the disabled will benefit many elderly people as well as families with small children.

Effect of Ageing on functional abilities: -

- Sensory problems such as low vision or hard of hearing or deafness
- Motor problems due to frail health, arthritis or rheumatism (may use wheel chairs or different types of walking aids).
- Slower ability to react.
- Slower to learn new skills
- Slower to interpret complex display scenario
- Lower coordination and simultaneous capacity, which may due to effects of medication or other health problems.

Demographic Imperatives:

Our challenge is to achieve "Successful Ageing for Singapore" and the current draft on Barrier Free Code attempts to raise up to the challenges and the opportunity of providing for a family friendly environment that includes the needs of elderly, young and persons with disabilities. It is pertinent to note that primary disability is not the sensory, physical or cognitive impairment of the individual but it the unfriendly assault course encountered while moving through built environment that poses a serious threat to the independence and full social participation of persons with disabilities.

While it would be impossible to design any environment to the exact specifications of every group it is perfectly possible to create environment that will embrace and invite the widest possible range of users. This environment should be either designed initially for maximum flexibility to meet the various needs or adapted and used in ways to achieve that flexibility.

Greater sensitization of professionals such as architects, engineers, industrial and product designers and Changing Standards, attitudes and issues

Achieving that flexibility will often depend upon the underlying attitude and decisions of those responsible for the design, development and management of the built environment. Too often a token gesture towards disabled people seems to add cynicism to thoughtlessness. The ramp that provides wheel chair access to a non-negotiable building; Braille invitation into an environment that, once entered, proves positively hostile to persons with vision impairment etc.

Having said this there is now considerable evidence that, much can be achieved by sensitive and informed designs. Most of the key features of inclusive-design can be integrated into new building projects because of groundswell of social concern that exists for the interest of all members of society including those physically, cognitively or sensory impaired. Unless this opportunity is taken, the effects of thoughtless design will continue to erode the interests and rights of disabled people in almost every area - housing, employment, education, health care facilities, leisure and transport.

Most housing organizations, architects and building project managers now do recognize that inclusive design not only enhances the quality of life for everyone who uses a building, but it does say something about the cultural values and social values of the supervising agencies.

How do people with vision impairment get around?

Independent versus assisted travel

People who are blind or vision impaired strive to maintain highest-level of independence. Many people who are vision impaired have small amount of usable residual vision and they will use whatever vision they have, together with other techniques, to find their way around. They also use the white cane for orientation and to detect obstacles in their way

White cane

One of the most common mobility aids is the white cane. This is used to scan the area in front of the user across the body width plus a little extra. The cane touches the ground at the end of each arc, as the tip of the cane is in constant touch with the ground. The long cane picks up obstructions at ground level, such as the base of lampposts, kerbs and steps. The cane cannot pick up obstructions above 200mm such as a horizontal rail or barrier as also waist or head level barriers such as vegetation or underside of stairs.

Assisted travel

Some individuals may use another person's assistance to move around. But with nuclear families and demands of modern day lives using sighted guide is going to make that person dependent on others support. This may result in their being ultimately isolated at home and from the community.

Physical Cues

Physical structures such as buildings, walls, fences and kerbs can act as cues to assist independent travel. For example the white cane might follow the fence line from one point to another assuming there is a clear way immediately adjacent to the fence. Intermittent contact with the fence and the white cane helps to keep the person on right track. Physical cues may also be picked up underfoot or sometimes by echolocation.

Other Sensory Cues

Persons with low vision are well experienced in gathering and interpreting information from sources other than vision such as through touch, sound and smell. Tactile and /or audible information may be gathered to supplement or enhance visual information. Such information may be provided deliberately or it may occur unintentional in a given environment.

Landmarks

These are unique features in a given location that assists in orientation. Knowing the location of the landmark and the layout of its immediate surroundings will help those with low vision to orient themselves and aid them in their mobility.

Mind maps

Used extensively by persons with low vision. Even where high quality access features have been provided, it will still be necessary for someone who is blind to be familiar with the location before they can travel independently. The sighted guide or orientation and mobility trainer will describe to them to enable the person to build a mind map of the ecological environment.

Clear Continuous Accessible Path of Travel (CCAPT)

Pedestrian space must be free of barriers, hazards and /or obstructions so that the access path is logical, predictable and barrier free.

Layout

Layout must be logical, predictable and barrier free. This makes it easier to memorize the environment. Example stairs next to the lift or male and female toilets located next to each other. Common problems in layout are confusing corridors, obstructions in circulation routes, such as columns and fire extinguishers or hazards such as the underside of staircases which people can walk into.

Tactile Ground Indicator Surface (TGSI)

There are two types of TGSI:

A Warning Indicators

Warning indicator as the name indicates, warn of either a hazard or of a destination. Can be identified either by the cane or by foot thus warning or informing the user that they are at the top or bottom of the staircases, pedestrian crossings, wharves, escalator, lifts or station platform etc.

These indicators can facilitate location of amenities such as ticketing machine, phone booths etc.

B Directional Indicators

Directional indicators are used to direct the user from one point to another along a safe path of travel. For example in an open pedestrian plaza or MRT stations to indicate a clear path of travel in the absence of any other cues.

The directional indicators helps in :

Direction - to indicate a clear continuous accessible path of travel, or

Location - to provide assistance to locate to target such as pedestrian crossing, entrance to a public building, ticketing machine or phone booth.

Principles of application of TGSi

Minimalist application: Wide spread and adhoc application of TGSi will confuse rather than inform and will compromise effectiveness of the specific cues provided.

Dimensions: Dimensions of the treatment are critical. For TGSi to be identified under foot, it is important to ensure that a minimum depth of treatment is applied. To be detectable under foot, the treatment must make contact with the ball of foot. So a minimum depth of 600 mm in the direction of the travel is essential. This dimension is applicable for both warning and direction treatments at their initial point of identification.

Colour and Luminance Contrast

TGSi should be colour and luminance contrasted against their surrounding surface to as it facilitates persons with residual vision to get around. A minimum luminance contrast of 30 percent is required to fulfilling this principle.

Orientation and position

A warning treatment should be applied perpendicular that is at the 90 degrees, to the line of approach or to the target object. In addition, a warning treatment should be set back 300 mm from the hazard or target object.

A direction treatment is usually applied along the centerline of the indicated path of travel and must provide a minimum clear way on either side of at least 800mm in which there is no obstacle or obstruction.

Application

- Pedestrian crossings and kerb ramps
- Stairs, steps, escalators and passenger conveyors
- Flush pedestrian vehicular way

Impact of TGSi on other pedestrian users:

Extensive research has taken place to support the dimensional requirement for tactile ground surface indicators. This research has confirmed that the provision of TGSi at a dimensional height of 5mm is sufficient to impart adequate tactile information whilst at the same time not adversely affect other pedestrian users. The 5 mm pavement variance is generally accepted to within the tolerances for pedestrian and wheel chair users.

Design guidance for internal and external environment:

Visibility - Color and tonal contrast

Partial sight, aging and congenital color deficits all produce changes in perception that reduce the visual effectiveness of certain color combinations. Two colors that contrast sharply to someone with normal vision may be far less distinguishable to someone with visual disorder. Color and tone contrasted, textured surfaces can greatly enhance visibility. Critical surfaces of internal or external environment helps form shape, space and proximity when scanned by a visually impaired person. Ceilings, walls, doors, floors, handrails, stair nosing, doors, glass panels, light switches toilet or bathroom accessories and so on must be sufficiently differentiated from each other.

Lighting

Consistent and optimum lighting is consistent and need to be glare free. It is useful and important that users can control lighting levels, including natural daylight, to avoid being dazzled or to increase lighting to perform a task. Fluorescent lamps and incandescent lamps also affect the how the colors are differentiated.

Decorative finish

Interior design and decorative finish add warmth and character to a building. Used well in can also highlight features and shapes aiding blind and partially sighted people to orientate and navigate within it and help them to develop mind maps. An example may be highlighting a column so that it does not blend into the background or is not decorated with mirrors.

Reflective finishes such as marbled or tiled floors can produce glare and disorient users. Complex patterns may also have same effect.

Building services

These include controls on buildings such as lighting switches, heating and lift call buttons. It is important people can find and use these controls so they can use a building in comfort. In a lift this may mean tactile and Braille lift buttons and audible floor level announcement. Some careful thought also needs to be addressed regarding emergency egress procedures.

Signage and information

BIGGER BOLDER AND BRIGHTER

Signage is an important element in enabling people to use the building and also to give information, direction, identification and safety. Reading and understanding signs, instructions and directions are very important when using environments. Designers are now challenged to think in interdisciplinary terms keeping lighting, typography, graphics etc in mind.

- ❑ Signs must be simple, short and easily understood.
- ❑ Signs need to be consistent, standardized using recommended typeface such as sans serif or serif
- ❑ Signs need to be suitably lit by good lighting or by use of back illumination and free of reflection.
- ❑ A sign should contrast with its background such as walls or doors. A border around the sign can help visibility.

- Braille should be used, if possible, wherever embossed characters are used.

In conclusion, we are confident that the recommendations in the Barrier Free Code will not give rise to a sterile, institutional, aesthetically unchallenging environment. It is just the care and attention to details that is necessary when designing for persons with disability will in truth surprisingly enhance the functional efficiency and aesthetic appeal of the built environment. The careful use of design features, color, texture and tone contrasting, co-ordination and well planned lighting will provide a hospitable and warm environment, and at the same time enabling persons with visual impairment and other disabled persons to use the built environment on equal and unobtrusive terms with the population in general.