



Architecture: A Tool for Creating an Enabling Environment for physically challenged Persons.

Ugwu Faith Amarachi¹, Imaah Ono Napoleon²

^{1&2}Department of Architecture, Rivers state university, Nigeria.

ABSTRACT:

Due to the high rate of physically challenge persons on the street of Nigeria, it has become of high demand to create a source of independency for this class of persons. Their talents can be harnessed; their dependency on others for survival reduced and their living conditions will also improve if an enabling environment is created to support them physically, socially, and mentally. An accessible environment is the key to achieve such. So, creating an accessible training environment where they can acquire some vocational skill and become independent is of essences. This paper emphasizes the physical aspect of creating an enabling environment and addresses practical ways in which architecture can be used to create an enabling environment for mobility-impaired person, visual impaired person and hard to hear persons. The information contained in this paper is mostly obtained from secondary sources of data collection; books, existing literature, articles, magazines, slides, journals, and personal observations. Mobility impaired persons can be independent financially and otherwise if given the right environment and opportunities. Architectural barriers to accessibility like ramps, elevators, lifts, stairs, railings, entrances, doors, corridors, etc. in a built environment can be designed in such ways that are accessible and safe for both the Able and Disabled. Designers should be encouraged to always design for people with disabilities in mind especially in public buildings to help flatten the curve and get everybody involved in societal building.

Keywords: Enabling environment, Accessibility, Mobility impaired, Barriers.

INTRODUCTION

In Nigeria, individuals with disabilities are mostly found in parks, bus stations and streets asking for help since the government and most of their family members have forsaken them. They live in hardship and dependency on people for feed and living. Out of Nigerian assessed populace of over 200million around 27million individuals live with disabilities (Hanifen 2019) and "indeed we have an ethical obligation to eliminate the hindrances to interest, and to contribute adequate subsidizing and ability to open the tremendous capability of individuals with inabilities." Professor Stephen Hawking.

In this paper, physical challenge people refer to individuals with physical or tangible disability, for example, wheel chair clients, individuals with hindered capacity to walk (utilization of bolsters, sticks, counterfeit appendage), hard of hearing individuals, older individuals matured 75yrs or more this weaknesses could be brief or perpetual and can be related with age, injury or illnesses equipped for affecting a person severally.

1.1 ENABLING ENVIRONMENT:

An enabling environment reflects nothing short of what one offers a rich, fluctuated, and safe space in a setting wherein people can flourish and capacity to the most amazing aspect of their abilities. The world health organization records that 15% of the total populace are living with inabilities and this populace has abilities and numerous commitments they can offer the general public. One of the significant contemplations in establishing an enabling environment is available, it is how much an item, administration, or climate is accessible to however many individuals as would be prudent. It is the capacity to access and profit from an element.

2.0 METHODOLOGY

This paper explored secondary sources for data collection which entails the study of existing literature and data relating to people with disabilities and architectural barriers. A thorough literature search was carried out online to understand the experiences and limitations faced by mobility impaired persons and how Architecture can be a tool to creating a balance.

3.0 DISCUSSION.

Disabilities have caused some individuals to be grouped into enormous minority groups kept from roles and for the most part, disregarded by society. They live in isolation, separation, destitution, a noble cause, and in many cases an object of pity. Because of their disabilities, they don't go to public spots, and aside from being mocked, they are not allowed those rights which a non-incapacitated individual gets. They are either denied schooling or the school system is not supported. Mainstreaming and general access for mobility-impaired people are a definitive objective of handicap development. In most cases, barriers faced by mobility-impaired persons are usually physical or architectural. When building landscapes or spaces limit people's access Architectural obstructions occur. Examples of these barriers are:

- Lack of ramps at the entrance or inside the buildings
- Absence of lifts and elevators.
- Lack of automatic or push-button doors.
- Low lighting or weak colour contrast.
- Narrow sidewalks, doorways, and aisles.
- High shelves.
- Tables without kneeling and toe cleaners.

ARCHITECTURAL DESIGN CONSIDERATIONS:

Here, we will be discussing the basic design requirements of vertical and horizontal access on both new and existing constructions. It is subdivided into Ten (10) elements

1. Ramps
2. Elevators
3. Platform lifts
4. Stairs
5. Railings and Handrails
6. Entrances
7. Vestibules
8. Doors
9. Corridors
10. Restrooms

3.1 RAMPS:

The ramp is a slanting pathway joining two distinct levels. It is utilized inside and outside remotely to give access and an option in comparison to steps on account of wheeled things. The most extreme ramp of a slope ought to be with the end goal that it is simple and safe for its clients be it young ones or grown-ups. There are wide scopes of thought in planning a slope for portability disabled individuals which incorporate;

- The steepness by length and width
- The distance between landings
- The likely users and mode of assistance they may require
- The material used for surface finishing
- The position of handrails
- The available space
- The location of the door and its swing direction.
- Cost of construction and maintenance
- The colour of the landing must contrast with the going.



Figure 1: Ramp with handrails

In summary, Ramps should be provided with landings at every 10m, change in direction, and the beginning and end of every ramp for resting, maneuvering, and avoiding excessive speed. The entrance ramp should be placed immediately adjacent to the stair for visibility and ease of access.

3.2 ELEVATORS:

An elevator is a platform used for vertical movements within floors of a building. It can either be enclosed or closed, manually or mechanically operated.

Design considerations for mobility-impaired people:

- There should be tactile numerals placed on both sides of the door at 1.5m high for virtually impaired persons
- The elevator should serve all floors in the building.
- Provision of the handrail at 0.8m high on three sides of the elevator.
- The control buttons should be mounted at 0.9m to 1.20m above floor level for wheelchair users.
- Control buttons should be illuminated.
- Audio and visual commands should be provided.
- The door opening intervals should be not less than 5seconds.
- A key-operated elevator should always have an operator present to assist.



Figure 2: Interior and Exterior views of an Elevator

In summary, while providing elevators in public buildings the entry door and inside the elevator cab should be wide enough for wheelchair users and the opening time interval must be sufficient.

3.3 PLATFORM LIFT:

A platform lift is also known as a wheelchair lift, this device is fully automated and is used for raising wheelchair users over a stair. It can have either a vertical or inclined movement.

Design considerations for mobility impaired people:

- One should consider what movement the lift is going to take whether vertical or inclined.
- A vertical platform lift should have different existing points
- For a change in levels of 2.5m, a vertical platform lift should be installed adjacent to the stairs while changes in levels of more than 1,2m but up to 2.5m should be placed close to the doors at different access points.
- The operating system can either be lateral or suspended for inclined movement platform lifts.
- The minimum width and length of the stair to which it will be installed should be 0.9m and 1.20m respectively
- The platform seat should be designed such that it can be folded when not in use



Figure 3: A lady on wheel chair in a platform Lift

In summary, platform lifts can be installed on any stair type and is usually used to connect more than one floor or overcome split levels. It can also be called, stairway lift or wheelchair lift

3.4 STAIRS.

Stairs is a series of steps connecting different floor levels in a building.

Design considerations for mobility impaired people:

- All steps should be uniform.
- Open risers are not recommended.
- Circular stairs is not a good option for mobility impaired people so should be avoided.
- The minimum stairwell width should be 0.9m and 1.5m for one or two way traffic respectively.
- Sharp edges should not be used for threads.
- Nosing should be rounded or flushed and should not project more than 40mm.
- Colourful tactile marking strip should be used at the top and bottom of the stair to alert the visually impaired.
- Steps should be slip resistance for avoid fall.
- Stairs must not have open translucent risers.



Figure 4: Stairs with Handrails

In summary, staircases should have railings to aid movements for people with disabilities.

3.5 RAILINGS AND HANDRAILS:

RAILINGS AND HANDRAILS:

A handrail is a rail that is intended to be held by the hand while moving up or down the flights of stairs or inclines to forestall fall. It is normally mounted on the divider.

Design considerations for mobility impaired people:

- Handrails ought to be not difficult to grasp.
- Minimum width between handrails should be 1000mm
- Railings ought not to impede the way of development.
- To help use for youngsters, a rail ought to be mounted at 0.06m.
- To encourage use for wheelchair clients, handrails ought to be mounted somewhere in the range of 0.70m and 0.75m from the floor.
- Handrails for the older and ambulant handicapped ought to be mounted at a stature somewhere in the range of 0.85m and 0.95m over the completed floor level.
- If windows are situated lower than 1.00m on the arrival, there ought to be a related handrail for wellbeing.
- Handrails ought to be introduced in latrines and washrooms to help versatility weakened people.
- Sharp edges ought to be maintained a strategic distance from.
- The space between the handrail and divider ought to be 40-50mm for smooth dividers and 60mm for unpleasant dividers.
- Handrail should be ended so that it alarms clients it has reached a conclusion; this can be accomplished with the utilization of a D return.



Figure 5: railings and handrails on a ramp

In summary, railings should be installed in high risk areas like ramps, stairs, toilets and bathrooms, balconies, raised platforms and contrasting colours is recommended for the comfort and safety of every user of the facility.

3.6 ENTRANCES:

An opening, similar to an entrance, segment, or entryway, that licenses induction to a spot.

Design considerations for mobility impaired people:

- Entrances ought to be planned so that it is praised and effectively distinguished.
- The entrance entryway tone should not quite the same as the structure tone to help simple acknowledgment.
- A non-tricky material ought to be utilized for access to dodge danger.
- In a situation where the passageway entryway opens apparently, the base arrival ought to be 1.2 by 1.2m.
- The utilization of signs ought to be utilized.



Figure 6: An Entrance to a building.

In summary, entrances to public buildings should be made accessible to everybody regardless of their abilities and inabilities. The creative use of ramps and stairs can be employed.

3.7 VESTIBULES:

A vestibule is a completely enclosed unconditioned space that separates the interior of a building from the exterior. It creates a trapped entrance and usually leads to a larger space.

Design considerations for mobility impaired people:

- Vestibule entrance door can either be sliding or swinging type.
- Doorways should be adequate. For a small exit vestibule a minimum width of 1,20m double swinging door can be used.

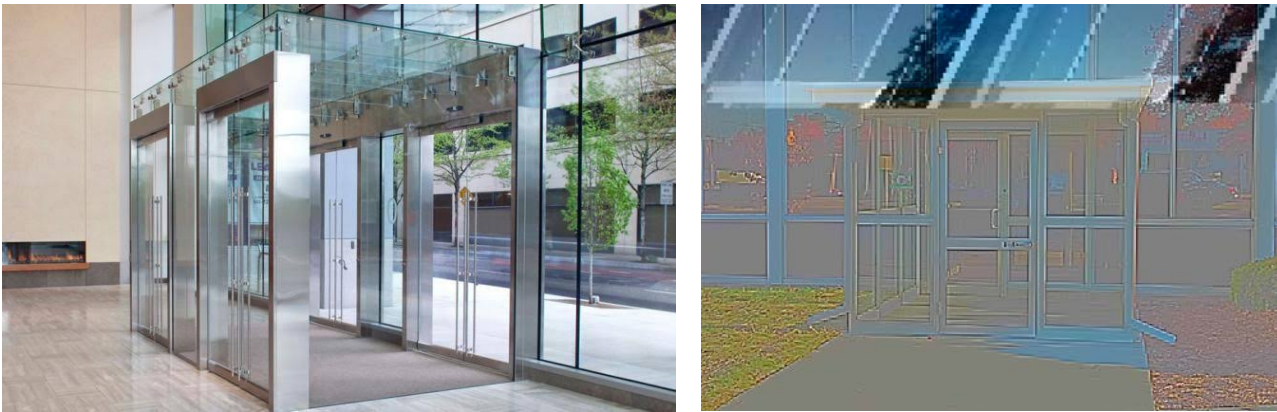


Figure 7: Vestibules

In summary, a vestibule should be adequate to manoeuvre a wheelchair between two sets of doors and in a case of limited space a sliding door should be used of swing direction should be in such a way that both doors swings outward.

3.8 DOORS:

A door is a movable barrier that allows entrance and exit into a space; it can be made from materials like wood, glass, metal, steel, paper, fibre, stones etc.

Design considerations for mobility impaired people:

- Doors should be design such that entrance and exit will be effortless.
- Sliding and automated doors are preferable for mobility impaired persons.
- A door should have a sign with an adequately placed handle.
- The minimum toilet door opening should be 0.75m and should have signs should be placed on door plates.
- Door or door frames should be painted in a contrasting colour to the walls for easy identification.



Figure 8: A glazed sliding door and wooden swing door

In summary, liver type door handles is advised to be used because it's easy to open with different techniques and completely glazed doors should be avoided in a building frequently used by virtually impaired persons to avoid accidents.

3.9 CORRIDORS:

A corridor is simply a hallway or passage in building connecting different parts of a building.

Design considerations for mobility impaired people:

- The walkable space of a low traffic corridor should be a minimum of 0.90m
- 1.50m should be the minimum width of an obstructed public corridor.
- A standard size for a public corridor is 1.80m.
- The minimum circulation space to enable a wheelchair U turn in a public corridor is 2.4m.
- Changes in surface levels of more than 13mm should be ramped
- Materials used for floor finishing should be non-slip and even.
- In the case where carpets are used, it must be securely fastened.



Figure 9: Lobby with proper lighting.

In summary, long and narrow corridors should be avoided as it makes orientation difficult. The minimum width for two wheelchairs to pass each other and for one to make a full turn is 1.50m.

3.10 RESTROOMS:

A room in a public building which provides toilets and lavatories.

Design considerations for mobility impaired people:

- A turning diameter of 1.50m is recommended inside the restroom to allow for maneuvering of wheelchair users
- Toilets compartments for people with impairments should be indicated.

- The size of water closets should meet minimum requirements.
- The height of the toilet seat should be between 0.45m-0.50m.
- Grab bars should be installed in appropriate positions in the toilet.
- Toilet papers should be placed within reach.
- Wall-mounted water closets are recommended.
- No shelf must be located above the washbasin which is placed at a height of 0.80m to 0.85m above floor level.
- Toilet doors should be lockable from inside and releasable from outside in the case of emergency.
- Wall-mounted mirrors should be suitable for use by those seated and standing.
- Materials used for flooring should be easy to clean and drain.
- Alarm systems should be put in place.

In summary, toilet seats, bidets, shower seats, and bathtub seats are required to be mounted at the same height as the wheelchair i.e. between 0.45-0.50m above floor level.

4.0 RECOMMENDATION AND CONCLUSION:

Making an environment accessible and safe for everybody is creating an enabling environment. A person with a disability can feel less vulnerable if he has access to everything an able person is accessible to without barriers. The environment a person finds itself has a way of creating either positive or negative vibrations which can enable or disable the performance of a mobility-impaired person.

Here in Nigeria, we are missing out on the values people with disabilities can add to our society by not creating an enabling environment (Cobhams 2019) and architecture can be a useful tool in creating such environments if enacted building codes are implemented strictly.

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