

**RESEARCH PAPER****Analysis of Shopping Malls in Lahore to Evaluate Design Provision for People with Special Needs****¹Rayyan Ahsan* ² Usman Awan and ³Mamuna Iqbal**

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ABSTRACT

This paper aims to examine need based facilities provisions in the shopping malls in Lahore like, washrooms, elevators, ATMs, parking and navigational aids, as important attributes. The research adopted quantitative and qualitative methods of data collection and analysis, consisting of research and analytical phases. The Research phase involved data collection, literature review, case studies, interviews, which are then used to inform the Analytical phase to draw conclusions, by comparative analysis of local and international shopping malls concerning the provision of facilities for handicapped users. The research findings suggest though there are facilities provided but improvements are needed in several areas, especially in terms of design considerations for physically challenged users. The research offers a framework and modular analysis of the selected study, providing a contextual approach for the development of architectural design. It also recommends design innovations in the selected mall to address the identified discrepancies and enhance the user experience for designers to consider.

Keywords: Accessibility, Shopping Mall, Handicapped, Disability**Introduction**

The harsh reality for disabled people that they encounter in the built environment is social, mental, and physical barriers that restrict their movement and access. In Lahore, most of the buildings are not accessible to handicapped users. To give equivalent chances to all, it is important to look with the eyes of these individuals. Architects should not view the designing for handicaps as a sort of constraint or compromise on the architectural design but should conceive it as a prime perceptual orientation to humanity, improving social stability, and enhancing the building values and its built environment.

Shopping malls should facilitate everybody of any age group. People are more attracted to the shopping malls that facilitate their every need, allowing unrestricted movement, and multiple entertainment options. As a result of urbanization, the demand for environmentally friendly shopping malls is increasing rapidly. The major attributes that attract people to shopping malls are ease, leisure, variety, mall essence, and parking. These attributes act as conjunctive elements that connect consumption and ambience.

The design of existing shopping malls in the Lahore covers a very limited number of attributes. The growing number of customers has affected the quality of service. Therefore, it is essential to examine the spatial layout of the malls in accordance with the latest trends and international standards. This evaluation will aid in enhancing future needs. The study focuses on attributes, such as washrooms, entrances/exits, stairs/lifts, etc., that are widely integrated into shopping malls around the world, and handicapped users, elderly people, and pregnant women friendly, as shown in *Figure 1*.

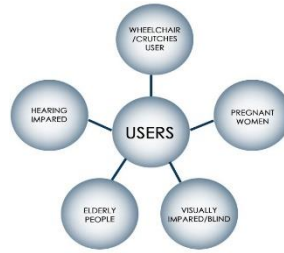


Figure 1 Selected Users for the Research

Literature Review

Shopping is a social activity for utilities and recreation (Lim, J., & Beatty, S. E., 2011). The more users are satisfied with the mall, the more time they are likely to spend. It has been suggested by the research that the attributes of the shopping mall play a major role in the selection of the shopping mall to visit (Jackson, Stoel & Brantley, 2011).

The research limitation is dependent on need-based facilities. Specifically for the research, ease as one of the major features of the shopping mall has a great impact when a mall is chosen for the visit (Khare, 2011). Another study recognized a few characteristics of the shopping mall that encourage functionality, convenience, well-being, safety, leisure activities, atmospherics, and hygiene at the shopping malls (El Hedhli, Chebat, & Sirgy, 2013).

Time-Saver Standards for Building Types (De Chiara, 2001) provide the standards regarding the selected attributes to be given in a shopping mall. Universal design advocates the need for accessibility and emphasizes that every public space should be designed to facilitate everyone, regardless of their age or physical abilities, to the maximum extent possible. Although, there are many definitions, as per the 'National Disability Authority' - "Universal Design accounts for the design of products, environments, and services to be usable by all people, to the greatest extent possible."

The literature review highlights the need for facilities to be prioritized and fulfilled for user comfort. These values can be elaborated in terms of different activities. For example, in utilitarian attr Shopping is a social activity for utilities and recreation (Lim, & Beatty, 2011). The more users are satisfied with the mall, the more time they are likely to spend. It has been suggested by the research that the attributes of the shopping mall play a major role in the selection of the shopping mall to visit (Jackson, Stoel & Brantley, 2011).

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in utilitarian attributes, restrooms are crucial and must adhere to certain guidelines. There should be at least one completely accessible bathroom for each gender.

Hence, it is concluded that the need-based facilities provide various design considerations when designing shopping malls, ultimately improving customer satisfaction. The provision of these attributes in the mall is another important factor that visitors consider. The main point extracted from the literature review is the existing knowledge gap due to the lack of framework available to be referred to while designing the shopping malls.

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Material and Methods

The methodology adopts both qualitative and quantitative approaches. The methodology is divided into two parts, a Research phase, and an Analytical phase. The research phase will take all the information through data collection, literature survey, questionnaires, case studies, interviews, etc., and then statistically process the findings. The Research processes then will be gathered to help with the analytical phase and these findings will be further analyzed to draw conclusions.

Research outcomes will include the comparative analysis of both local and international shopping mall standards and the bylaws/regulations set by official authorities, as shown in Table 1 & Table 2, regarding the facilities provided or not provided for handicapped users. There will be proposals and guidelines in terms of theory, design or policies to improve/amend or introduce the laws and regulations regarding the architecture and built environment, for the architects and designers, about prioritizing the needs to facilitate the handicapped users.

Table 1
Requirements of users regarding selected attributes

PwDs/ Attributes	Elderly	Wheelchair Users	Hearing Impaired	Visually Impaired/Blind	Pregnant Women
Washrooms	Centralized/Located at regular intervals, reducing walking distance	At least 1 washroom was designed accordingly and the handles were kept at a reachable height	Signage placed at regular intervals	Braile Language used on the sign board	Centralized/Located at regular intervals, reducing walking distance
ATMs	Centralized/Located at regular intervals, reducing walking distance	Designed accordingly to enable their accessibility		Braile Language used along with regular buttons	Centralized/Located at regular intervals, reducing walking distance
Stairs	Escalators				Escalators
Lifts	Centralized/Located at regular intervals, reducing walking distance	Designed accordingly and buttons kept at a reachable height		Braile Language used along with regular buttons and voice operator to indicate the floor levels	Centralized/Located at regular intervals, reducing walking distance
Rest Rooms	At least 1 on each floor	At least 1 on each floor	Signage placed at regular intervals	Braile Language used on the sign board	At least 1 on each floor

First Aid Room	Centralized to reduce the walking distance	door handle/s at a reachable height	Signage placed at regular intervals	Braile Language used on the sign board	Centralized to reduce the walking distance
Entrances/Exits	Steps with less riser and longer tread and handrails installed	Door handles at reachable height, ramps at the ratio of 1:10 and handrails installed	Signage placed at regular intervals	Steps with longer tread and handrails installed	Handrails installed
Parkings	Near to the entrance	Near to the entrance	Signage placed at regular intervals	Near to the entrance	Near to the entrance
Navigations			Signage placed at regular intervals	Use of sound/smell elements without repetition, eg: water bodies, fragrant plants, etc.	

Table 2
By-laws regarding selected attributes (no laws for emergency exist, navigation and restroom for special people)

ATTRIBUTES	Toilets	Stairs/Lifts	Entrances/Exits	Parking
LDA Buildings Regulations & Bylaws	Atleast 1 toilet for disabled patrons must be provided	Lifts must be provided keeping in mind the standard sizes and in case of non-provision of lifts, a ramp should be provided of the ratio 1:10	A ramp having a width of 4ft and a gradient ratio of 1:10 must be provided	
DHA Construction Regulations	Atleast 1 toilet for disabled patrons must be provided	Lifts must be provided keeping in mind the standard sizes	Every commercial building having an area of 4500 sqft or above shall have at least one access/exit for disabled persons, which shall be indicated with proper signage. The entrance shall be through a ramp (slope not more than 25 degrees) together with a stepped entry. A handrail shall be provided with the ramp if the number of steps are more than four.	Space for parking one car at road level near the main entrance with a maximum travel distance of 20 feet to the main entrance and one in the basement parking (if provided) for every 4500 Sft of area
Bahria Town Buildings Bylaws & Regulations	Atleast 1 toilet for disabled patrons must be provided	Lifts must be provided keeping in mind the standard sizes	A ramp having a width of 5ft and a gradient ratio of 1:10 must be provided	
Lahore Cantonment Board Buildings Bylaws	Atleast 1 toilet for disabled patrons must be provided	Lifts must be provided keeping in mind the standard sizes and in case of non-provision of lifts, a ramp should be provided of the ratio 1:12	A ramp having a width of 6ft and a gradient ratio of 1:12 must be provided along with the handrails	Space for parking close to the main entrance must be provided with a travel distance of less than 25ft to the main entrance The parking spaces for the disabled have access aisles of not less than 5 feet on both sides of the parking space for cars and not less than 8 feet

access aisle on both
sides of the van

The population of the study is mainly users of the shopping mall and registered architects. These users are subdivided into two categories, i.e., customers and shopkeepers, as shown in Table 3.

Table 3
Users and Selected Attributes

USERS	SELECTED ATTRIBUTES
Customers/Shopkeepers	Washrooms
	ATMs
	Stairs
	Lifts
	Rest Rooms
	First Aid Room
	Entrances/Exits
	Parkings
	Navigations

Questionnaire

The questionnaire consisted of open-ended questions to explore participants' perceptions of shopping malls, their preferred activities, and any challenges they faced in that environment. The participants were also asked about their perceptions of what helped or hindered their experience in shopping malls, and how these environments could be improved to better meet the needs of people with disabilities.

Interviews

To explore how architects approach the needs of disabled people in the built environment, a study was conducted in Lahore using open-ended interviews with registered architects. Participants were asked a range of questions to elicit their qualitative opinions on designing shopping malls for disabled access requirements. Key insights included considerations for the types of disabled users to be accommodated, design features typically incorporated in shopping mall design, suggestions for further improvements, and the interplay between regulatory requirements and architects' perceptions of their responsibilities. Architects were also interviewed to gain their perspective on what shopping malls meant to their clients with disabilities, how they utilized the malls, and what obstacles they faced.

Case Studies: The case studies involved the use of an access audit checklist, which was created in accordance with international standards to evaluate the accessibility of public facilities in the case studies. This included assessing areas such as parking spaces, ramps, main entrances, doors, stairways/lifts, emergency exits, first-aid rooms, accessible restrooms, and overall navigation within the malls, as shown in Table 3. The assessment was carried out based on the latest guidelines for accessibility standards, as shown in **Error! Reference source not found.** & **Error! Reference source not found.**

Xinhua Mall, Gulberg

Xinhua Mall, located on Mian Mehmood Ali Kasoori Road in Gulberg III, Lahore Figure 2, was built in 2001 and is recognized as the trendiest mall in the city. This multipurpose shopping mall is a landmark, standing 20 stories tall and easily accessible from all major roads and highways.

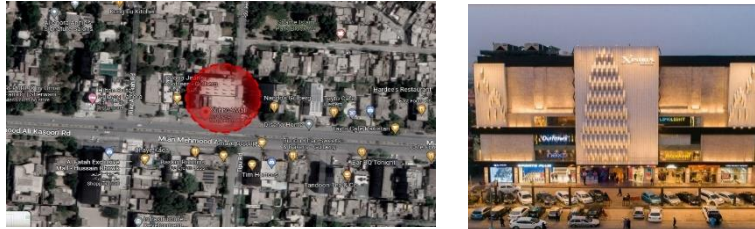


Figure 2 Xinhua Mall location and Exterior

Characteristics as per the Selected Attributes

The Xinhua Mall falls under the regulatory board of LDA. As per the bylaws of LDA discussed earlier, Xinhua Mall covers very few of them:

- There is no ramp at the main entrance of the mall but a single lift is provided in the basement for people with physical disabilities and elderly people to enter the mall, as shown in Figure 3 below.



Figure 3 Main Entrance, and Ramp at Basement

- Every lift, provided for vertical travelling is of the same size; 2 ft 6 inches, as shown in **Error! Reference source not found.**, which is less for the wheelchair to enter Figure 4.
- There is no braille button system provided inside the lift for people with visual impairments Figure 4.

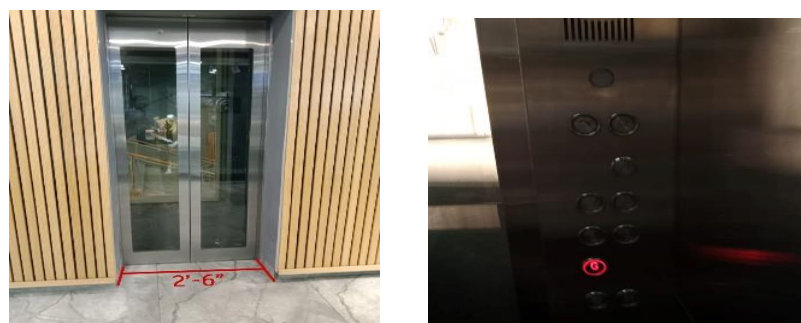


Figure 4 Lift with 2'-6" and no braille button

- Emergency exits are provided with both lifts and stairways. There is no ramp provided for that.
- There are no restrooms or first-aid rooms on any of the floors.

- Toilets are provided on 1 floor only. There is a step at the entrance of the toilets, as shown in Figure 5 below. Also, it does not incorporate a toilet designed for handicapped users.



Figure 5 Step at door

- The door handles are not designed as per the height of wheelchair users making it difficult for them to reach.
- There are parking lots provided for handicapped users and it is also closer to the entrance, as shown in Figure 6 below.

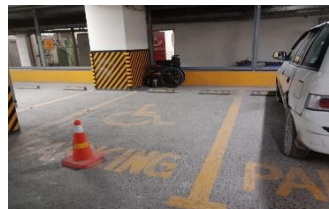


Figure 6 Basement Parking at the Mall

MALL OF LAHORE, CANTT

Located at 172 Tufail Road, Cantt, Lahore, the Mall of Lahore is a shopping complex based in Lahore, Pakistan Figure 7. Designed by renowned architect Nayyar Ali Dada, the Mall of Lahore was completed in 2009.



Figure 7 Location of Mall and Exterior

Characteristics as per the Selected Attributes:

Mall of Lahore falls under the regulatory board of Cantonment, Lahore. As per the bylaws of the cantonment board discussed earlier, the mall of Lahore fulfils some of them:

- The ramp is provided of standard ratio at the main entrance of the mall, as shown in Figure 8 below.
- Majority of the parking is provided in the basements with some of it on-site. However, none of the parking caters the parking lots for handicapped users Figure 9.



Figure 8 Ramp at the Main Entrance

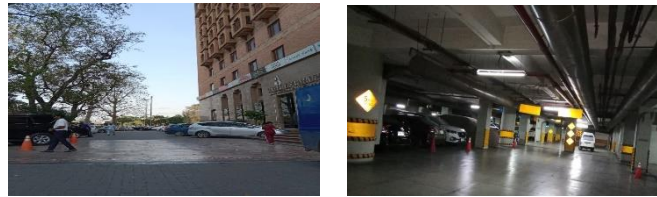


Figure 9 On-site parking and Basement Parking

- The Mall has elevators, escalators, and lifts installed Figure 10.
- Every lift is of standard sizes but the height of buttons is higher for wheelchair users and also there are no braille button systems, as shown in the figures Figure 10.



Figure 10 Size and Height of lift, and no Braille Buttons

- The door handles are not designed as per the height of wheelchair users.
- For emergency situations, the Mall of Lahore has only staircases Figure 11.



Figure 11 Emergency Staircases

- There are no restrooms or first-aid rooms.
- The toilets are on 1 floor only. There is no toilet for handicapped users, nor the heights of fixtures are according to Figure 12.

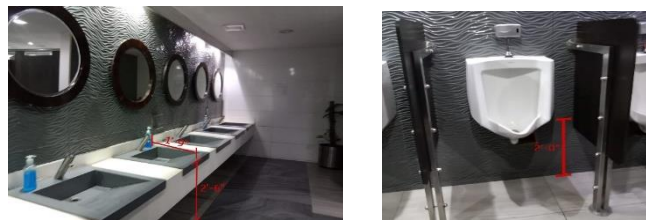


Figure 12 Toilets in the Mall

Gold Crest Mall, Phase IV, DHA

The Gold Crest Mall & Residency is a prestigious commercial project developed by DHA Lahore and Giga Group Holdings with a covered area of 13,34,927 sqft, located in the prime DHA Phase IV area of Lahore Figure 13 Completed in 2019.



Characteristics as per the Selected Attributes:

The Goldcrest Mall falls under DHA, Lahore. As per the bylaws, the mall fulfils almost all of them:

- The ramp is provided of standard ratio at the main entrance of the mall.
- Majority of the parking is provided in the basements with some of it on-site. There are parking spaces for handicapped users and the parking is also closer to the entrance, as shown in Figure 14 below.



Figure 14 Basement Parking

- The major setback is that to enter the lift area from the basement there is a step-up and a step-down, making it impossible for handicapped users to use it, as shown in Figure 15 below.



Figure 15 Step up & Step down

- There are elevators and escalators installed to facilitate the users, especially elderly people, and pregnant women Figure 16.
- There are no restrooms or first-aid rooms.

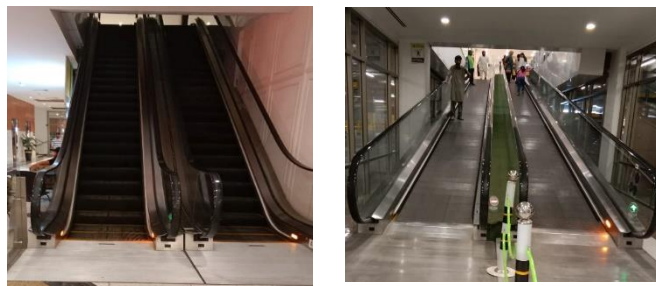
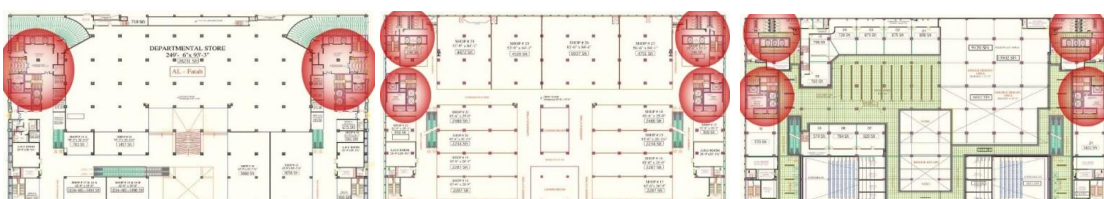


Figure 16 Escalators

- The toilets and the lifts are located at both ends of the mall reducing the traveling distance from the shops, as shown in floor plans below Figure 17.



- Toilets are provided on each floor and there is one toilet for handicapped users as shown in the Figure 18 below.

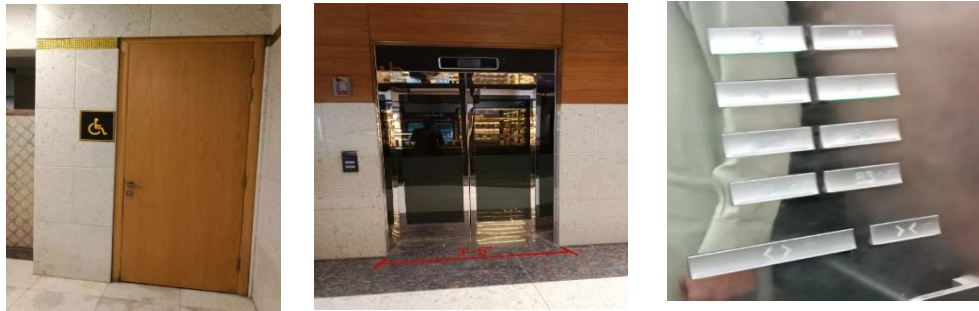


Figure 18 Washroom, Lift opening and Buttons Height

- Every lift is of standard sizes but the height of buttons is higher for wheelchair users and also there are no braille button systems.
- For emergencies, there are only stairways Figure 19.

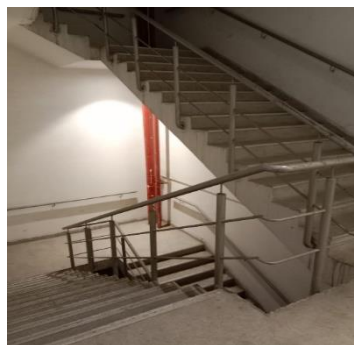


Figure 19 Emergency

JASMINE MALL, BAHRIA TOWN:

Jasmine Mall Spanning a vast area of 85,000 square feet Figure 20.

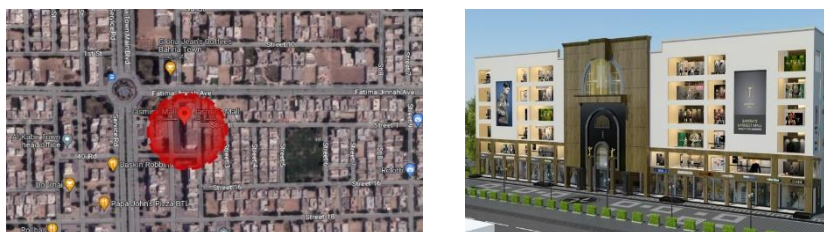


Figure 20 Jasmine Mall Location and Exterior

Characteristics as per the Selected Attributes:

Jasmine Mall falls under Bahria Town, Lahore. As per the bylaws, the mall fulfils a few of them:

- There is no ramp at the main entrance.



Figure 21 Step at Entrance

- The Parking is provided on-site with no parking lots for handicapped users.
- The lifts and elevators are located centrally, as shown in the floor plans below, to reduce the travelling distance Figure 22.

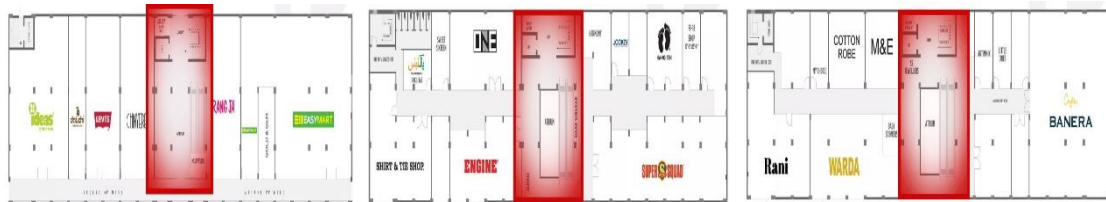


Figure 22 Floor Plans(Ground, F.F, Second Floor)

- There are elevators and lifts installed but the lift does not follow the standard size
- Toilets are provided on the 1st floor and 4th floor with none of them having a toilet for handicapped users. Moreover, there is a step at the entrance of the main door of the washrooms, shown in Figure 23.

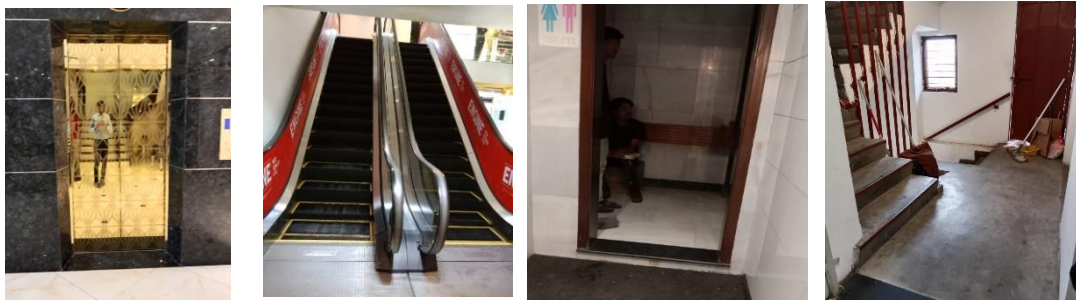
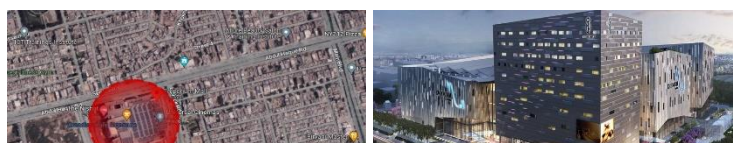


Figure 23 Lift, escalator, washroom(with step) and emergency staircase

- There are no restrooms or first-aid rooms.
- For emergency exits, there are only stairways Figure 23.

Emporium Mall, Johar Town

The Emporium Mall is a stunning masterpiece of modern design Figure 24. Completed in 2016, a vast area of 2,700,000 square feet.



Characteristics as per the Selected Attributes:

The Emporium Mall falls under board of LDA, Lahore. As per the bylaws, the mall fulfils almost all of them:

- There is a ramp almost at every entrance/exit of the mall and the ramps follow the standard ratio of 1:10 for a ramp.
- Majority of the parking is provided in the basements with very few on-site. There are parking spaces provided for handicapped users at every level of basements and also it is closer to the main entrances.
- There are lifts, escalators, and elevators in the mall with the majority of them located centrally and also some of them at both ends of the mall, hence, reducing the travelling distance from the shops Figure 25.

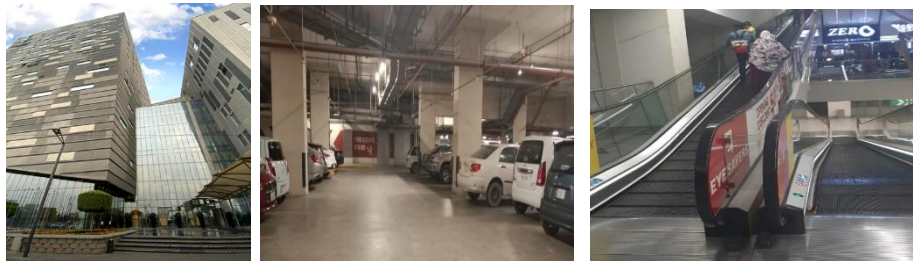


Figure 25 Main Entrance. Parking and Escalators

- Every lift follows the standard size with enough space for wheelchairs. Also, there are braille buttons installed. The only flaw is the heights of the buttons are not reachable from wheelchairs Figure 26.



Figure 26 Lifts and Braille Buttons

- Toilets are provided on each floor with a toilet for handicapped users on every floor.
- The door handles are not designed as per the height of wheelchair users making it difficult for them to reach.
- There are restrooms or first-aid rooms on every floor Figure 27.
- For emergency exits, there are stairways and lifts. No ramps are provided for it.

Discussion



Figure 27 Toilets for Handicapped

This study is an exploration of how people with disabilities experience the mall environment, providing empirical data and examining perceptions of mall use and obstacles among individuals with various disabilities. Unlike many other papers in this special issue which focus on a single type of disability, this study takes a more comprehensive approach. The selected attributes are categorized as perceived barriers or improvements for people with disabilities, older people, and pregnant women.

The research conducted in Lahore found that while some need-based facilities were inadequate, others were suggested to be provided. The study utilized interviews with persons with disabilities and architects/designers, resulting in a more comprehensive understanding of the issues involved. Reviews such as this study provide a valuable summary of available evidence for professionals and policymakers to utilize practically.

Case Studies Analysis

The analysis of case studies highlights the amount of effort that is still required to design a shopping mall that facilitates every sort of user. The gap between bylaws and their implementation is quite large which affects the impact of a shopping mall with regard to the users’ experience Figure 28. The international standards should be followed and there should be strict adherence to the local bylaws for future shopping malls in Lahore.

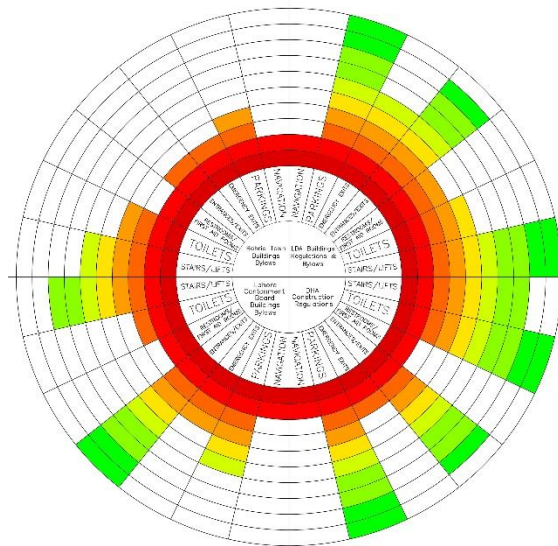
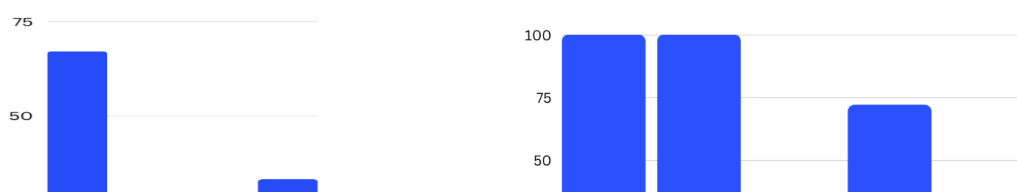


Figure 28 Malls Analysis Chart

regarding Bylaws and their implementations

Users’ Response on the Local Malls:

The majority of the people (72% and 67%) agreed that both washrooms and first aid room/restroom must be centrally located because then the covering distance would be lesser especially for elderly people, pregnant women, and physically disabled patrons while remaining of the people (28% and 33%) feel that they should be located at the corners Figure 29.



In response to the quantity and the location of the washrooms in a mall, every respondent stated that there should be at least 2 washrooms and they should be on every floor, whereas no respondent mentioned that the washrooms should just be on one-floor Figure 30.

In response to the difficulties, they face in the malls, the highlight was the accessibility. The unavailability of the ramps at the entrance proves to be the major hindrance. The lack of washrooms designed following their requirements and the size of lifts were among the other common issues that they often face in a mall. The physically handicapped patrons stated that the door handles, desk/racks, and lift buttons are generally unreachable for them. The hearing and speaking impaired users indicated the problem of lack of signages that help them locate their desired space. The elderly people and pregnant women generally highlighted the issue of parking normally being far from the main entrance, no railings, the unavailability of restrooms, and the location of washrooms, saying that they have to travel long distances for it. They emphasized that these issues need to be resolved and avoided in future mall designs. The visually impaired or blind people stated the significant issue of their navigation from outside to the inside of the malls. They feel that they can't move on their own in a mall. With their smelling and hearing senses being much stronger, they believe that there should be some sort of elements with different fragrances or sounds that will help them identify their location. Another issue stated by them is the lift's button. They feel that a braille system button should be installed alongside the regular buttons so that they can use the lift on their own.

Everyone emphasised having parking close to entrances. However, there is mixed response when it comes to the number of parking spaces there should be, Figure 61. The majority (30%) of people say that there should be 8-10 parking spaces for handicapped patrons. 14% of the respondents said 2-4 parking spaces, 23% said 4-6 and 18% said 6-8. 10% believed in 10 parking spaces whereas the least number of respondents (5%) felt to have 1 or 2 Figure 31.

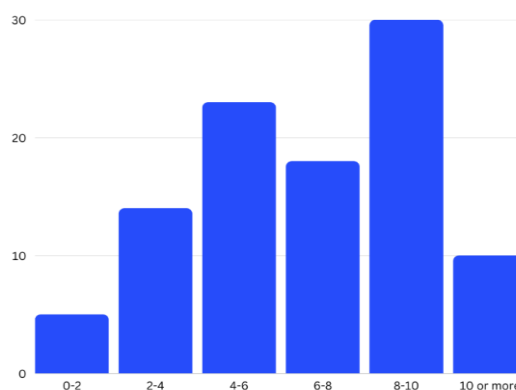


Figure 31 Number of parking spaces

In response to the emergency exits, all the respondents preferred to have ramps rather than lifts, as they are easy to use.

Architects' View Regarding Disability and Individuals with Disabilities

Many experts argue that designing for accessibility can only be considered truly inclusive when it accommodates individuals with a diverse range of physical and/or cognitive disabilities. The survey participants' responses were categorized as "always," "sometimes," "rarely," or "never," as illustrated in **Table 4 & Table 5** below.

The focus was primarily on the stereotypical representation of physically impaired individuals or those who rely on wheelchairs. Survey respondents commonly defined disability as "providing access for the physically impaired," which can reinforce a simplistic and stereotyped view of what disability entails. This narrow definition runs the risk of directing architects towards particular design approaches and solutions for disabled individuals, which may not adequately address the range of other impairments that exist.

Table 4
Architects' considering type of handicapped user when designing

RESPONSE/ PwDs	Always	Sometimes	Rarely	Never
Physically Disabled	3	8	4	-
Hearing Impaired	-	3	2	10
Visually Impaired	2	5	3	5
Speaking Impaired	-	2	2	11
Elderly People	8	5	2	-
Pregnant Women	5	7	3	-

Architects play a crucial role as key agents, and their understanding of different user groups is essential in shaping the design process. However, limited perceptions of disabled user groups may indicate that architects do not consider the increasing diversity of design requirements in shopping malls.

Table 5
Architects' considering the attributes when designing

Response/ Selected Attributes	Always	Sometimes	Rarely	Never
Washrooms	2	9	4	-
ATMs	-	2	6	7
Stairs/Lifts	10	5	-	-
Restrooms	-	3	8	4
First-Aid Rooms	4	4	7	-
Entrances/Exits	10	5	-	-
Parking	2	5	5	3
Navigation	-	-	2	13

This estrangement is partly due to the absence of consultative and participative mechanisms between architects, design teams, and disabled individuals. Evidence suggests that even when architects attempt to consult with disabled people, their efforts are often constrained by selective representations. These typically come from individuals who are mobility-impaired or rely on wheelchairs, potentially reinforcing architects' preconceived notions instead of challenging them. In particular, architectural education and training may contribute to the production of professionals who are defined by their technical and specialist skills, leading them to draw strict boundaries around their practices.

Architects must reconnect their practices with broader social issues. The design and development of buildings and the built environment have the potential to facilitate or hinder people's movement and mobility. Certain designs, such as shopping malls and other public-

private spaces, have the power to exclude and demarcate individuals, making it imperative to prioritize accessibility in all design decisions.

Conclusion

The research findings highlight the inclusive nature of the shopping mall attributes in the case study. As users of shopping malls belong to various age groups and genders, these attributes are interconnected in terms of user-based facilities. These facilities are defined differently by various users and can meet numerous customer requirements if provided as suggested by users and recommended in standards. The study focused on specific attributes for user comfort, and it was concluded that these attributes can satisfy customer's needs. The architecture and design of the shopping mall define its shopping attributes, which have a significant impact on user experience. In summary, the research concludes that most shopping malls do not appropriately offer these selected attributes for user facilitation, and they seem to prioritize retail services over these need-based facilities. These characteristics play a vital role in attracting a large number of customers to shopping malls.

Recommendations

The research concludes with several recommendations for improving user facilities by addressing the need-based facilities. To enhance user convenience, it is suggested that washrooms be available on every floor, accommodating differently-abled individuals, and an Automated Teller Machine be present on each floor with ample space around it. In case of emergency, emergency exits should have standard-sized ramps, and every entrance/exit should have a ramp with railings for elderly and pregnant individuals. Navigation facilities should be available for visually impaired users, such as planters with different fragrances and water bodies to help them navigate by smell and sound. Additionally, a restroom and a first aid room for emergency care should be provided in the shopping mall. Parking should be closer to the main entrance. The recommended need-based facilities can attract numerous customers to shopping malls and enhance user comfort. Shopping mall designers should consider these attributes according to standards to attract customers.

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