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Research Article

User Accessibility in Shopping Malls: Towards Compliance and Inclusive Design

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Abstract

Accessibility within shopping malls is a critical component of inclusive architectural design that ensures equitable use of spaces by all individuals, including persons with disabilities (PWDs). Despite the existence of national and international accessibility frameworks, such as Nigeria's Persons with Disabilities (Accessibility) Regulations 2023 and the United Nations Sustainable Development Goals, many commercial facilities in developing countries remain inadequately designed for universal access. This study examined the extent of user accessibility in selected shopping malls across Nigeria, identifying compliance gaps with established accessibility standards. A quantitative research approach was adopted, employing an observational checklist and a structured questionnaire administered across fifteen malls in different regions. The collected data were analysed using descriptive and comparative statistical techniques. Findings revealed that while most malls provide basic access routes and entry points, significant deficiencies persist in key accessibility features such as ramps with handrails, tactile and braille signage, accessible restrooms, and auditory/visual information systems. Inconsistencies in spatial circulation, emergency egress, and auxiliary amenities reflect widespread non-compliance with the Persons with Disabilities (Accessibility) Regulations 2023. The study concludes that some Nigerian shopping malls generally lack comprehensive accessibility planning, posing challenges to comfort, independence, and safety for users with disabilities. It recommends stricter enforcement of accessibility regulations, heightened stakeholder awareness, and the integration of accessible design principles into architectural practice. These measures are essential to fostering inclusive public environments and advancing Nigeria's progress toward the United Nations' 2030 Agenda for Sustainable Development.

Keywords: Persons with Disabilities (PWDs); Accessibility compliance; Shopping mall design; Public buildings; Accessibility audit; Inclusive architecture

Highlights

- Nigerian shopping malls show widespread non-compliance with the 2023 PWD Accessibility Regulations.
- Accessibility provisions prioritise mobility impairments, while sensory and information access are largely neglected.
- Critical deficiencies exist in emergency egress, wayfinding, and life-safety systems for persons with disabilities.
- Accessibility audits reveal a persistent gap between legislative intent and architectural implementation in Nigeria.

1 Introduction

For a building to be accessible, the ease with which users can reach, enter, and utilise its facilities is essential (Imrie, 2012). This consideration is crucial in the design and planning of shopping malls to optimise user experiences (Steinfeld & Maisel, 2012). Furthermore, accessibility in shopping malls is vital to ensure that a diverse range of users, including people with disabilities, can navigate and interact smoothly in both exterior and interior spaces (Sholanke & Adisa, 2025). Modern shopping centers have developed from simple retail hubs to multifunctional destinations that incorporate entertainment, dining, and social activities (Han et al., 2019). However, poor circulation patterns and limited accessibility features can discourage visitors, leading to lower customer satisfaction and revenue (Sholanke & Adisa, 2025). Architects and other professionals involved in the built environment must consider elements such as wide aisles, clear signage, ramps, and automated entrances to make shopping centres inclusive for everyone. Research indicates that user-centric designs increase foot traffic and foster consumer loyalty (Chowdhury et al., 2024). Furthermore, Mshelia, Idakwoji, & Audu (2025) underscored that the adoption of user-accessible design concepts and features can enhance mall usability for those with diverse disabilities, ultimately leading to increased foot traffic and improved consumer loyalty. Adams, Green, and Patel (2019) also investigated how new spatial layouts make it easier for people to move about and cut down on traffic jams in malls during busy times. In poorer countries, problems like bad infrastructure, bad maintenance, and failure to enforce rules making places accessible to people with disabilities worsen the problem. To make malls more accessible, urban planners, policymakers, private investors, and other people who work in the built environment need to work together to eliminate these barriers, such as implementing universal design principles and ensuring compliance with accessibility standards.

Shopping malls have become multipurpose locations in the past few years, meeting a wide range of shopping, entertainment, and social demands for visitors (Shakya, 2023; Truspekova & Nurpeis, 2019). Even if these malls are becoming more important, problems with accessibility and circulation still make users unhappy and slow down the whole process (Hosseini, Yeganeh, & Jalali, 2024). Research also shows that problems with accessibility can lead to fewer customers, lower customer retention, and, in the worst circumstances, legal penalties for not meeting accessibility standards. Clark and Williams (2018) also observed that malls that did not meet basic accessibility standards lost money because of disgruntled customers. Also, bad access methods for the outside and inside of a building can make things harder for visitors and even put their safety in danger, especially in crises when clear, easy-to-follow escape routes are important, which can lead to increased liability for the owners and further loss of business due to negative customer experiences.

In developing nations such as Nigeria, these issues are exacerbated by constrained resources, antiquated construction regulations, and insufficient understanding among stakeholders regarding accessible design principles (Ichendu, Ejike, & Irimiagha, 2024; Okonta et al., 2025). We need to research and address these problems right now to create retail malls that are easy for everyone to use and access. According to Mom (2025), just 1.5% of public buildings in Nigeria exceed accessibility criteria, which means that 98.5% of structures are inaccessible to people with disabilities (PWDs). The absence of exterior and interior characteristics in public buildings that facilitate user accessibility hinders the mobility, service access, and social participation of individuals with disabilities in many regions of Nigeria (Badawy, U. I., Jawabrah, & Jarada, 2020). Consequently, this study seeks to assess user accessibility in shopping malls throughout Nigeria, with the objective of proposing methods for architects to implement the PWDs (Accessibility) Regulations of the Federal Republic of Nigeria. The study's goals are laid out like this:

- Examine the user-friendly aspects of Nigerian retail complexes, and
- Examine what users think about the accessibility aspects of shopping malls in Nigeria.

This study specifically analyses architectural designs, spatial configurations, signage systems, walkways, and additional amenities for those with disabilities in selected shopping malls, utilising

Nigeria's Accessibility Regulations (2023) as a framework. Finally, this research is especially pertinent in developing nations, where user accessibility challenges are frequently neglected due to limited resources and knowledge. In explanation, the current literature indicates a deficiency of research that evaluates the development of Nigerian malls concerning persons with disabilities, utilising the Accessibility Regulations, 2023, of the Federal Republic of Nigeria as a standard. By highlighting this gap, the study underscores the necessity for focused initiatives that prioritise accessibility and inclusivity in commercial developments, including shopping malls.

2 Literature Review

User accessibility is crucial in designing spaces, services, amenities, and facilities that enable seamless interaction for everyone, including those with disabilities. There are essential factors to consider when designing shopping centres that cater to users with diverse needs. Firstly, the spatial planning and layout in malls should enable all users to navigate easily by incorporating features such as ramps and elevators, tactile paving, and Braille signage for visually impaired individuals, along with accessible restrooms and seating arrangements. Secondly, to promote accessibility in malls, people with disabilities should be able to access websites, applications, and digital platforms. This includes screen reader compatibility for visually impaired users; subtitles and transcripts for videos to assist those with hearing impairments; high-contrast settings; and custom fonts for readability (Marte & Vanderheiden, 2025). Thirdly, providing information in multiple formats enhances user accessibility and promotes inclusivity. Examples include Braille and audio versions of books in malls for individuals with visual impairments, simple language guides for people with cognitive disabilities, sign language interpretation in public communication, and other information systems for those with related disabilities (Lazar, Goldstein, & Taylor, 2015).

2.1 United Nations Sustainable Development Goals on Accessibility

The UN Sustainable Development Goals [SDGs] emphasise accessibility across several targets, primarily within Goal 11: Sustainable Cities and Communities, which advocates for universal access to safe, inclusive, and accessible public spaces and transport systems by 2030. Other goals that explicitly incorporate accessibility include Goal 10: Reduced Inequalities, which encourages the social, economic, and political inclusion of all individuals, including people with disabilities. Accessibility is also vital to Goal 4 [Education], Goal 3 [Health], and Goal 9 [Industry, Innovation, and Infrastructure], ensuring that services and systems are accessible to everyone, as outlined in the UN's 2030 Agenda for Sustainable Development (United Nations, 2015).

- Goal 11: Sustainable cities and communities
  Target 11.2: Ensure access to safe, affordable, accessible, and sustainable transport systems for everyone, with particular focus on the needs of PWDs.
  Target 11.7: Guarantee universal access to safe, inclusive, and accessible green and public spaces, especially for women, children, older individuals, and individuals with disabilities.

Other goals with specific accessibility targets (United Nations, 2015).

- Goal 10: Reduced Inequalities: Aims to promote the social, economic, and political inclusion of all, which depends on accessibility in all its forms (architectural, communication, digital, etc.).
- Goal 4: Quality Education: Ensures children, including those with disabilities, can access schools through accessible infrastructure and inclusive learning environments.
- Goal 3: Good Health and Well-being: Emphasises that accessibility is vital for healthcare, including the physical accessibility of clinics, affordable support systems, and simple access to information.
- Goal 9: Industry, Innovation, and Infrastructure: Covers ensuring that new infrastructure and technology are accessible to PWDs.

- Goal 16: Peace, Justice, and Strong Institutions: Focuses on ensuring public access to information and the physical accessibility of institutions like courts and police stations to secure access to justice (United Nations, 2015).

However, the global development agenda often neglects PWDs, despite the SDGs' ambition to leave no one behind (Panda & Kaur, 2024). According to the World Health Organisation, an estimated 16% of the world's population, or around 1.3 billion people, live with some form of disability (World Health Organisation, 2022). Nevertheless, they encounter significant barriers to accessing resources and to full societal participation, which can hinder their ability to reach their full potential and to achieve the SDGs (Panda & Kaur, 2024).

2.2 User Accessibility in Nigerian Malls

The Relatively, accessibility in Nigerian malls can be assessed using the Persons with Disabilities Act, which derives from the Discrimination against PWDs (Prohibition) Act, No. 2, 2018, of the Federal Republic of Nigeria – Official Gazette. This regulation outlines the features, systems, amenities, and facilities that buildings in Nigeria should provide for individuals with disabilities. Importantly, it applies to structures and facilities accessible to the public, including their owners and anyone involved in activities related to the built environment, such as audit teams, facility managers, public officials, architects, engineers, and developers (PWDs Regulations, 2023).

Moreover, the objectives of these regulations are to:

a. ensure effective collaboration with relevant agencies towards ensuring easy and unimpeded access to services in the Nigerian built environment by persons with disabilities;
b. provide specifications for policymakers, regulators, implementers, and service providers to ensure quality and non-discriminatory services in the Nigerian built environment;
c. provide standards and codes for the design and construction of an accessible built environment, including roads and transportation facilities;
d. provide a tool for measuring or auditing universal accessibility in the built environment;
e. guide developers, designers and other persons involved in the built environment process in incorporating accessibility principles in the planning, design, and execution stages of building work; and
f. increase awareness of accessibility standards and the need for a barrier-free design in the built environment (PWDs Regulations, 2023).

In addition, the Regulations apply to:

a. Ministries, Departments, and Agencies of Government (MDAs),
b. international organisations and non-governmental organisations,
c. structures and facilities accessible to members of the public and their owners, and
d. individuals undertaking any activity in relation to the built environment, including audit teams, facility managers, public officials, architects, engineers, and developers (PWDs Regulations, 2023).

Furthermore, the regulation, which also serves as a tool for measuring the accessibility of shopping malls in Nigeria, is divided into five chapters, as shown in Table 1.

Table 1. The arrangement of chapters and schedules in the PWDs Regulation (2023) (Source: Authors).

S/N	ITEMS
Chapter 1	OBJECTIVES AND APPLICATION
Chapter 2	EXTERIOR OR OUTDOOR AREAS
Chapter 3	REQUIREMENTS FOR INTERIOR OR INDOOR AREAS
Chapter 4	ENFORCEMENT AND COMPLIANCE
Chapter 5	MISCELLANEOUS PROVISIONS
Schedule 1	Figures, Symbols, and Tables
Schedule 2	Symbols and Abbreviations

In association with shopping malls, this study adopts the different requirements to ensure accessibility thereto as captured in Chapter 2 and Chapter 3 (Table 2).

Table 2. The parts of the exterior/outdoor and requirements for the interior of indoor areas (PWDs Regulations, 2023) (Source: Authors).

Chapter 2 - **Exterior or Outdoor Areas**	Chapter 3 - **Requirements for Interior or Indoor Areas**
Part I—Exterior Routes	Part I—Access to the Building
Part II—Transport Infrastructure	Part II—Interior Routes
Part III—Entertainment and Recreational Facilities	Part III—Interior Amenities
Part IV—Outdoor Amenities	Part IV—Interior Systems and Controls
Part V—Outdoor Support Systems	Part V—Special Facilities and Areas
Part VI—Other Exterior Features	Part VI—Other Interior Features

In summary, the Regulation sets out design criteria to ensure effective collaboration among relevant agencies in providing free and seamless access to services within the Nigerian built environment for PWDs; offers specifications for policymakers, regulators, implementers, and service providers to deliver effective and non-discriminatory services; clarifies standards and codes for the design and construction of an accessible built environment, including roads, transportation facilities, residential, commercial, and other building types; introduces a tool for assessing or auditing universal accessibility in the built environment; guides developers, architects, and other stakeholders in the built environment on how to integrate accessibility principles into the planning, design, and construction stages of projects; and promotes awareness of accessibility standards and the importance of barrier-free design (PWDs Regulations, 2023). Consequently, this study conducts an accessibility audit of selected malls in Nigeria to evaluate their compliance with the provisions of the PWDs (Accessibility) Regulations of the Federal Republic of Nigeria.

3 Methodology

This study adopted a quantitative research methodology designed to evaluate the accessibility features of shopping malls across the Federal Republic of Nigeria. The quantitative approach was deemed appropriate because it allows for objective measurement, comparison, and statistical analysis of accessibility indicators in the built environment. It also facilitates the systematic assessment of design strategies, spatial configurations, and facilities that promote inclusivity for individuals with disabilities (PWDs) in Nigerian shopping malls. The *Persons with Disabilities (Accessibility) Regulations, 2023,* served as the principal benchmark for evaluation, ensuring that the analysis aligns with contemporary national standards for accessibility. The study was guided by the framework shown in Figure 1, which illustrates the overall methodological process encompassing data collection, sampling, analysis, and validation procedures.

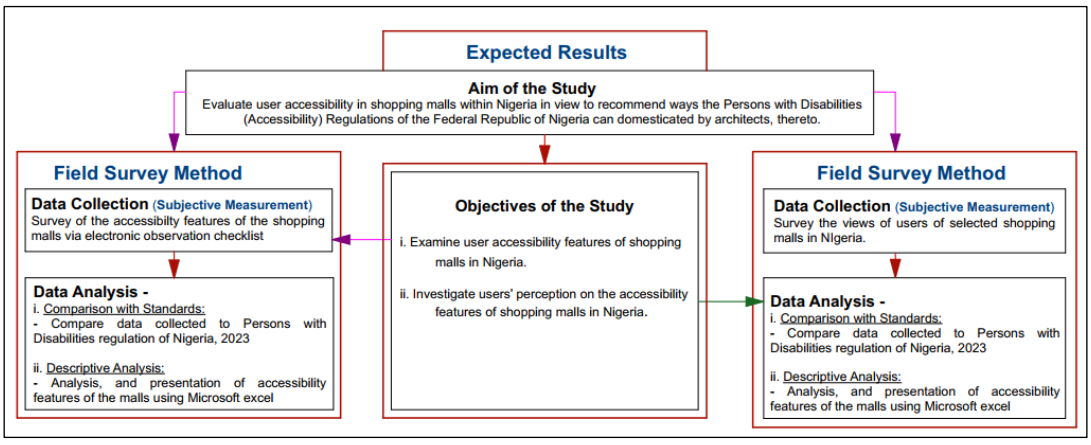

Figure 1. Methodological framework (Source: Authors).

3.1 Research Design

A cross-sectional field survey design was adopted to capture accessibility conditions across multiple shopping malls at a single point in time. This design enables the researcher to draw comparative insights among different types of malls and geographic regions while minimising temporal bias. Two key objectives guided the study: (1) to examine the accessibility features of selected malls in Nigeria, and (2) to assess users' perceptions of these features. To address these objectives, two principal data collection instruments were developed—an electronic observation checklist and a structured questionnaire.

The observation checklist comprised nine variables directly drawn from the *PWD Accessibility Regulations (2023)* and focused on assessing the physical accessibility elements within and around the malls. The questionnaire, on the other hand, consisted of twenty-six items designed to elicit users' perceptions and experiences concerning accessibility. Both instruments provided complementary perspectives — one from the physical audit of the built environment and the other from the human-user viewpoint, highlighting how structural features impact user experiences and accessibility perceptions. The data obtained were subjected to descriptive and comparative statistical analysis using *Microsoft Excel*. The results were presented in the form of tables, pie charts, bar charts, histograms, line graphs, and frequency polygons to enhance clarity and interpretation.

3.2 Sampling and Selection Criteria

Given the wide geographic spread of shopping malls across Nigeria, the study employed a non-probability (convenience) sampling technique. This approach was chosen due to the practical constraints of time, accessibility, and administrative permissions, which made it impossible to include every mall in each state. Consequently, fifteen shopping malls were purposively selected from different regions of the country to ensure both representativeness and diversity in architectural typology. The selected malls included a mix of community malls and neighbourhood malls, thereby allowing a meaningful comparison of accessibility features across different scales and contexts. Three key criteria guided the inclusion of shopping malls in this study. First was accessibility for data collection, which required managerial consent and physical access to both interior and exterior areas. Second, the malls had to meet basic functional and architectural standards, such as multiple floors, defined circulation spaces, and active commercial occupancy. Third, the selection aimed for diversity in mall typology, incorporating various sizes and regional contexts [North-central, South-east, South-west, and South-south geopolitical zones of Nigeria] to enrich the comparative analysis. This sampling approach enabled the study to provide a balanced overview of accessibility conditions across urban commercial developments in Nigeria. Although a convenience sampling approach was adopted due to practical constraints such as access permissions and geographic spread, efforts were made to ensure diversity in the sample by including malls across different regions and typologies, thereby enhancing the analytical robustness of the study.

3.3 Data Collection and Analysis

Primary quantitative data formed the core of this research and were gathered through two principal approaches: physical observation and structured questionnaires. The observation checklist captured tangible, measurable accessibility features such as ramps, elevators, circulation routes, restrooms, signage, and exterior access routes. Observations were recorded electronically on-site using mobile data collection tools. The questionnaire, administered to mall users and staff, complemented these findings by gathering perceptual data on ease of movement, comfort, safety, and inclusivity. To ensure analytical consistency, the study organised all the collected data into six thematic categories, adapted from the *Persons with Disabilities (Accessibility) Regulations, 2023*. These categories are: (i) Access to the Mall, (ii) Interior Routes, (iii) Interior Amenities, (iv) Interior Systems and Controls, (v) Other Interior Features, and (vi) Exterior Routes. Each theme contained several variables measured through the survey instruments. The data were processed using Microsoft Excel for descriptive and comparative analyses. Statistical summaries, including means, frequencies, and percentages, were generated to identify

patterns of compliance or deviation from the PWD standards. The use of visual statistical outputs, including histograms, bar charts, and pie charts, further facilitated the interpretation of findings and enabled more precise cross-case comparisons across the 15 sampled malls.

3.3.1 Instrument Structure and Description

The questionnaire was structured into two main sections. Section A captured the general characteristics of each selected mall, including its name, location, geographical coordinates, number of floors, and total floor area. Section B focused on accessibility indicators, organised into six parts that reflect the thematic framework earlier mentioned. Each part assessed a different aspect of accessibility, from the availability of ramps and elevators to the presence of wayfinding systems and restrooms designed for PWDs. Respondents rated each feature based on observed adequacy and usability. A summary of the malls surveyed is presented in Table 3. The sample covered malls located in Lagos, Abuja, Oyo, Delta, Rivers, Osun, Akwa Ibom, and Imo States, representing a blend of southern and northern regions. The selected malls varied in scale, from single-storey neighbourhood malls to multi-level community malls, with floor areas ranging from approximately 4,000 m^2 to 37,000 m^2. This diversity enabled a more robust comparative analysis of accessibility performance.

Table 3. Basic description of the selected malls for the study (Source: Authors).

Characteristic / Reference	Title / Location	GPS Coordinates	Type of shopping mall	No. of floors	Floor area (m^2)
Case study 1	Ikeja City Mall, Alausa, Ikeja, Lagos State	6°35'00"N 30°20'00"E	Community mall	2 floors	**23,000 m^2**
Case study 2	E-Centre Mall, 1-11 Commercial Avenue, Sabo Yaba, Lagos State	6°50'61"N 30°37'74"E	Community mall	3 floors	**< 37,000 m^2**
Case study 3	ShopRite Mall, Ring Road, Ibadan, Oyo State	$7^0$22'11"N $3^0$51'7"E	Neighbourhood mall	1 floor	**4,754 m^2**
Case study 4	Jabi Lake Mall, Sokoto Road, Jabi, Abuja	$9^0$06'27"N $7^0$49'98"E	Community mall	2 floors	**25,000 m^2**
Case study 5	Jara Shopping Mall, Ikeja, 22 Simbiat Abiola Way, Lagos State	$6^0$59'65"N $3^0$34'21"E	Neighbourhood mall	2 floors	**4,900 m^2**
Case study 6	Delta Mall, Effurun Roundabout, Uwie LGA, Delta State	$5^0$33'0"N $5^0$46'0"E	Community mall	2 floors	**13,980 m^2**
Case study 7	Market Square, Opolo, Bayelsa State	$4^0$94'81"N $6^0$33'36"E	Neighbourhood mall	2 floors	**< 11,000 m^2**
Case study 8	Osogbo Mall, Gbongan Road, Osogbo, Osun State	$7^0$78'08"N $4^0$56'02"E	Neighbourhood mall	2 floors	**5,000 m^2**
Case study 9	Delta Mall, Warri, Delta State	$5^0$33'0"N $5^0$46'0"E	Community mall	2 floors	**13,980 m^2**
Case study 10	Market Square, Plot 34 Woji Road, New GRA, Port Harcourt, Rivers State	$4^0$82'46"N $7^0$00'58"E	Neighbourhood mall	2 floors	**< 11,000 m^2**
Case study 11	Tropicana Mall, Uyo, Akwa Ibom State	$5^0$00'00"N $7^0$94'00"E	Neighbourhood mall	2 floors	**8,000 m^2**
Case study 12	SaveMore Marketplace, Okigwe Road, Owerri, Imo State	$5^0$53'09"N $7^0$05'04"E	Neighbourhood mall	2 floors	**< 11,000 m^2**
Case study 13	Priceless Stores, Okigwe Road, by Orji Flyover, Owerri, Imo State.	$5^0$31'39"N $7^0$03'50"E	Neighbourhood mall	2 floors	**< 11,000 m^2**

Case study 14	H-MEDIX, 87 4th Ave, Gwarinpa, Federal Capital Territory, Abuja	9⁰12'00''N 7⁰40'00''W	Neighbourhood mall	3 floors	**< 11,000 m²**
Case study 15	**Market Square, Orlu Road, Owerri, Imo State**	**5⁰50'00''N 7⁰02'00''W**	**Neighbourhood mall**	**2 floors**	**< 11,000 m²**

3.3.2 Quality Assurance and Control Measures

To enhance the reliability and validity of the research instruments, several control measures were implemented. First, all research assistants were trained on the use of the observation checklist and questionnaire to ensure uniformity in data recording. Second, questionnaires were administered only to respondents who demonstrated sufficient familiarity with the physical layout and operations of the malls. Third, a random cross-verification of observational data was performed to minimise human error and confirm consistency between different observers' records. Finally, all data entries were double-checked prior to analysis to avoid statistical distortions or missing values.

3.4 Data Types/Variables

The study examined variables classified under interior (indoor) and exterior (outdoor) categories, consistent with the provisions of the *PWD Accessibility Regulations, 2023,* as seen in Table 4. Interior variables focused on circulation systems, amenities, and control mechanisms, while exterior variables assessed approach routes, parking, and landscape accessibility. For interior areas, variables included pathways and doorways, ramps and lifts, restroom accessibility, signage and wayfinding, and emergency communication systems. For exterior areas, variables examined included zebra crossings, handrails, tactile markings, public address systems, and landscape materials. This holistic categorisation allowed the researchers to capture both the architectural and operational aspects of accessibility. The comparative analysis across these variables offered insights into the extent of compliance of Nigerian shopping malls with the universal design principles embedded in national accessibility standards.

Table 4. The categories of data and variables recorded for the study (Source: Authors).

Categories	Variables
INTERIOR OR INDOOR AREAS	
Access to the Mall	• Pathway from a parking space to the building. • Canopies and weather protection Reception area or information desk • Self-closing swing doors • Double-leaf doors and gates
Interior Routes	• Interior circulation routes • Fire escape routes via horizontal circulation • Lift • Interior ramps • Lighting platforms or daises • Self-holding areas • Stairs and steps • Turnstiles and control gates
Interior Amenities	• Access to interior amenities • Drinking fountains • Access to storage facilities • Restrooms and washrooms
Interior Systems and Controls	• Audible and visual information • Communication systems • Fire emergency systems and signals • Information systems and directories • Assistive listening systems

	• Signage and wayfinding
Other Interior Features	• Life safety plan • Maintenance • Drop-off or setting-down point *with ramp*
EXTERIOR OR OUTDOOR AREAS	
Exterior Routes	• Zebra crossings or crosswalks • Grades and elevation changes • Guards and handrails (general) • Ramps with mounted handrails • Tactile marking
Transport Infrastructure	• Garages and enclosed parking spaces • Clear space around facilities
Outdoor Support Systems	• Access to outdoor amenities • Public address systems
Other Exterior Features	• Colour, pattern and texture • Landscape materials and planting • Building materials & finishes

4 Results

4.1 User Accessibility Features of Shopping Malls in Nigeria

Observing various types of shopping malls was essential for this study to eliminate bias and identify whether specific malls had unique accessibility features tailored to the needs of PWDs. Accordingly, accessibility features of 15 malls were observed. Among these, 4 were community malls (33%) and 11 were neighbourhood malls (67%). Table 4 displays the visited malls and observed key locations across Nigeria, including Lagos, Abuja, Warri, and Oshogbo.

4.1.1 Access to the Malls

To assess access for individuals with disabilities, elements such as the pathway from the parking area to the mall, interior circulation routes, enclosed parking spaces, pathways to the building, canopies or weather protection devices, a reception area or information desk, double-leaf doors and gates, and self-closing swing doors were observed. It was observed, and it was strongly agreed, that 53.3% of shopping malls possess a pathway from the parking area to the mall, as seen in Figure 2. Accordingly, most malls provide basic external access routes, indicating a general awareness of pedestrian connectivity. However, the 20% dissent highlights inconsistency in design standards across malls.

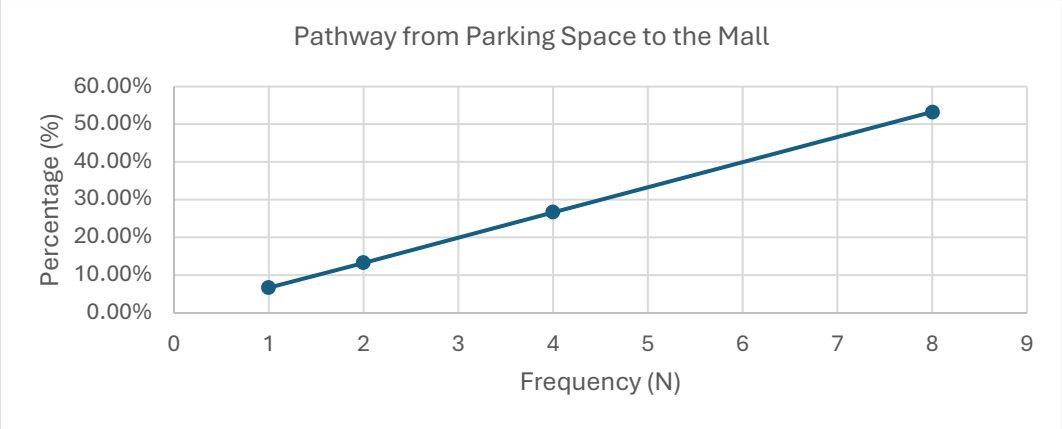

Figure 2. State of the pathway from the parking space to the malls (Source: Authors).

Furthermore, as shown in Table 5, 33.3% of malls had more than four interior circulation routes, 20% had between three and four routes, and 26.7% had only a single interior circulation route.

Table 5. Interior circulation routes in the malls (Source: Authors).

The interior circulation routes found in the mall	N	%
1	4	26.7%
3	3	20.0%
4	3	20.0%
More than 4	5	33.3%

An assessment of the enclosed parking spaces and pathways to the mall building revealed that 33.3% had neither, while 6.7% of malls had both pathways and enclosed parking. Furthermore, 26.7% of malls featured between 2 and 4 pathways and enclosed parking spaces. However, it was observed that 6.7% of malls lacked enclosed parking despite having pathways to the malls, as seen in Table 6.

Table 6. State of parking spaces and pathway to the malls for PWDs (Source: Authors).

Enclosed parking space and pathway to the malls	N	%
0	5	33.3%
1	1	6.7%
2	4	26.7%
More than 4	4	26.7%
No enclosed parking space, but there's a pathway to the mall.	1	6.7%

46.7% of malls were observed to lack canopies or weather protection devices for disabled individuals, and 6.7% have no signage to indicate this. In retrospect, 20% of malls have two of such weather protection devices for individuals with disabilities; 6.7% have one, and some have three, four, or more, as seen in Table 7.

Table 7. State of canopies/weather protection devices provided for PWDs (Source: Authors).

Canopies / Weather Protection Devices Provided for the Disabled	N	%
	1	6.7%
0	7	46.7%
1	1	6.7%
2	3	20.0%
3	1	6.7%
More than 4	1	6.7%
There's no signage to indicate this.	1	6.7%

There was a significant presence of a reception area, with 8 malls, or 26.7%, each having at least an information desk. One mall was observed to have a neutral area, while 40.0% (N = 6) of the malls did not have any such areas, as seen in Figure 3. Table 7 displays the findings regarding the frequency and percentage of the facility.

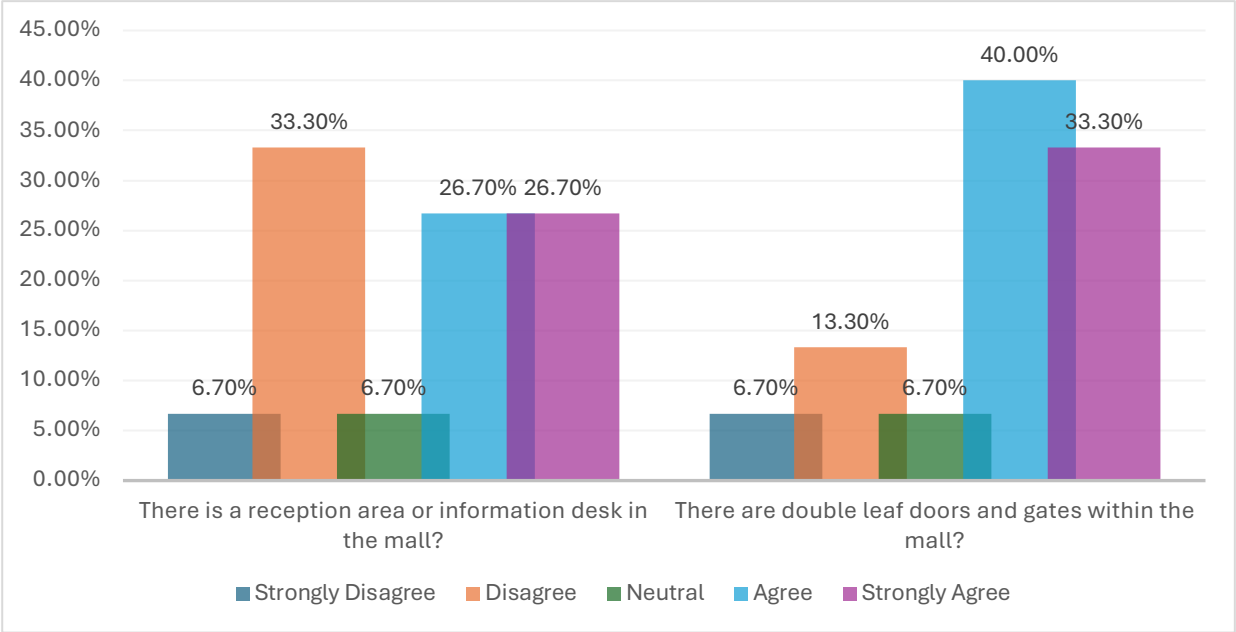

Figure 3. Reception area/information desk, as well as double-leaf doors and gates within the malls (Source: Authors).

The presence of double-leaf doors was a frequently observed feature, with 73.3% agreeing or strongly agreeing that such doors are present. Conversely, only 20% disagreed or strongly disagreed. Regarding self-closing swing doors, 33.3% reported there were no such doors, 53.4% noted 1–2 of them, and just 6.7% observed more than four, as shown in Figure 4.

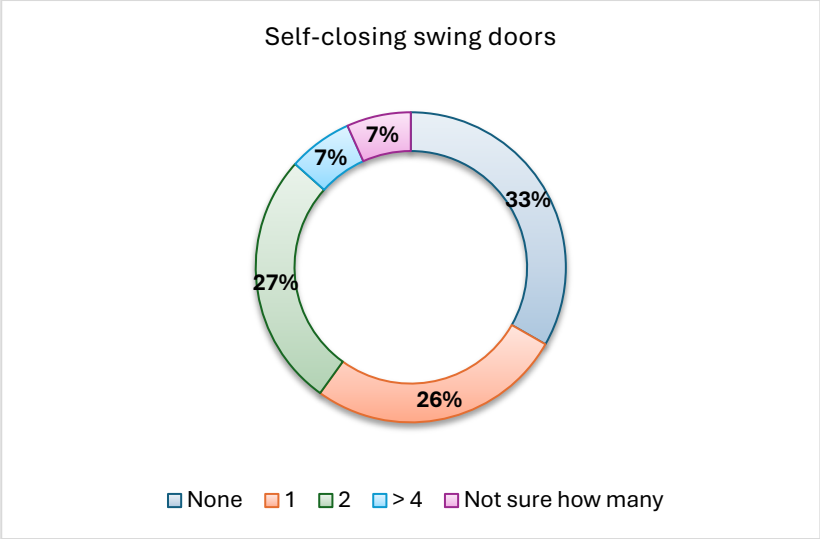

Figure 4. Self-closing swing door conditions in the malls (Source: Authors).

4.1.2 Interior Routes

Examination of the interior routes within the observed facilities showed that 53.4% of respondents agreed or strongly agreed that clear spaces are available around facilities for disabled users. Additionally, 26.7% disagreed or strongly disagreed, while 20% remained neutral. Furthermore, 46.7% reported having no dedicated escape routes, only 6.7% observed more than four, and 13.4% noted signage issues or a lack of awareness. Further observations also revealed that 20% of malls had no ramps, 53.4% reported 1–4 ramps or flat surfaces, and 20% observed more than four ramps, as shown in Figure 5.

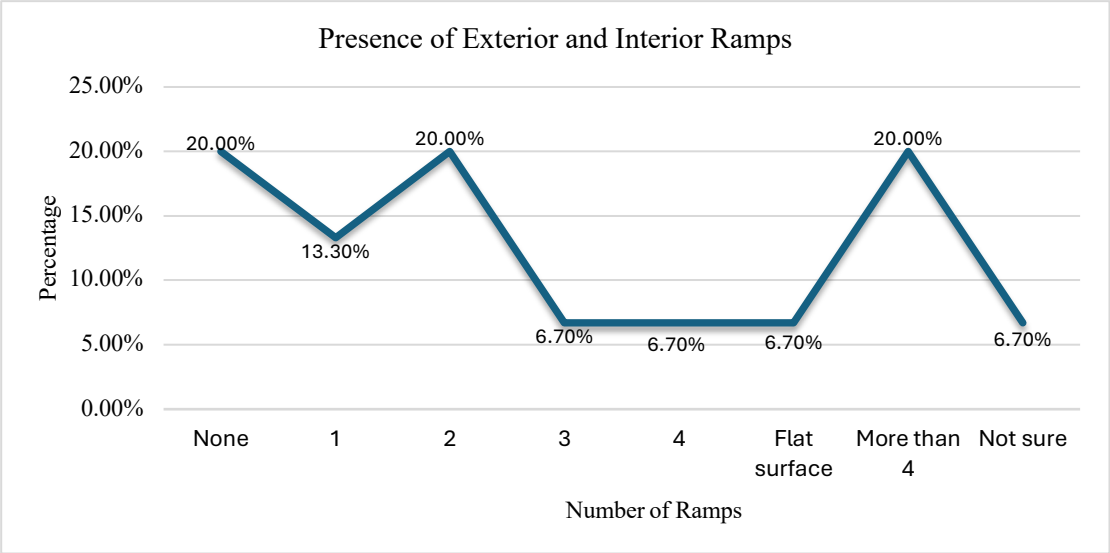

Figure 5. Exterior and interior ramps within the malls (Source: Authors).

46.7% reported no ramps with handrails, while only 13.3% observed more than four, and 20% counted just two, as seen in Figure 6. 6.7% reported seeing a single ramp with a handrail, while another 6.7% reported seeing no ramps or handrails.

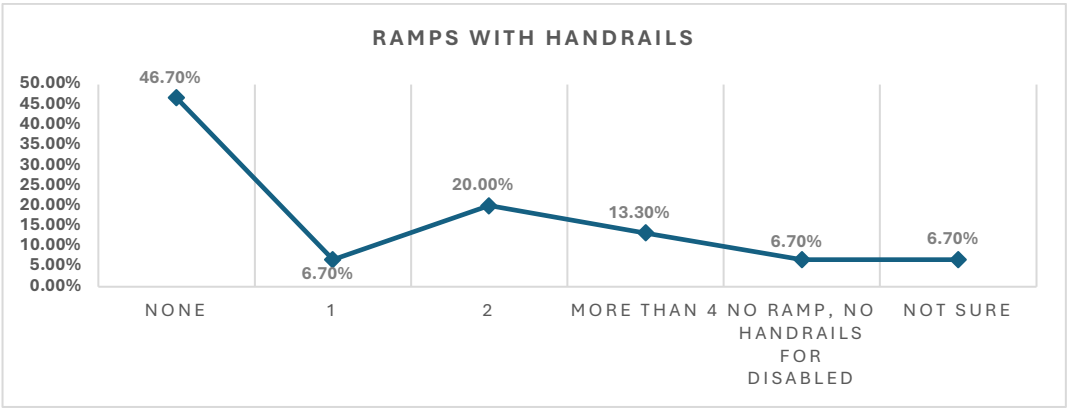

Figure 6. The percentage of ramps with handrails within the malls (Source: Authors).

Regarding lighting platforms or daises, 40% were neutral, 33.3% disagreed or strongly disagreed, while only 20% agreed, showing that visibility for individuals with disabilities is poorly considered, as seen in Figure 7.

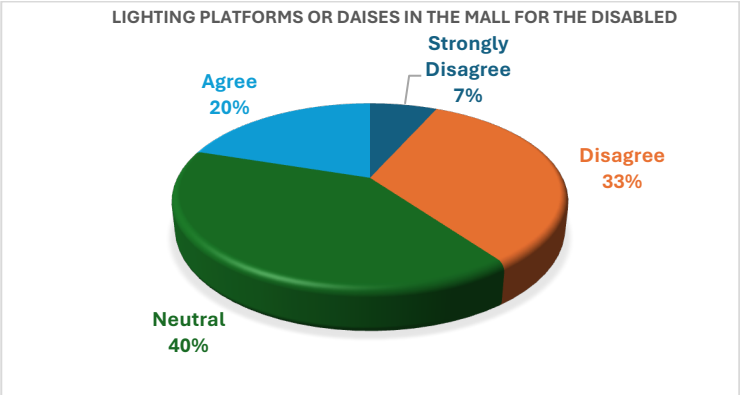

Figure 7. Lighting platforms or daises in the malls for PWDs (Source: Authors).

For instance, field observations conducted at Market Square, Orlu Road, Imo State, revealed several deficiencies in accessibility provision. This widespread non-compliance is illustrated in Figure 8, where ramps are constructed without handrails and appropriate slope considerations, thereby compromising safety and usability for persons with disabilities. Furthermore, physical obstructions were evident, as shown in Figure 9, where guard rail configurations restrict movement and reduce effective circulation width for wheelchair users.

Figure 8. 1200mm wide ramp with 7^0 slope angles positioned without handrails, and signage (Source: Authors).

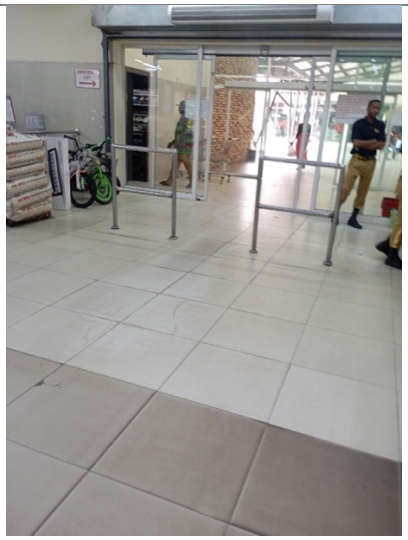

Figure 9. Pre-function lobby featuring guard rails that restrict the movement of PWD (Source: Authors).

4.1.3 Interior Amenities

Study findings on interior accessibility amenities for disabled individuals within observed shopping malls revealed that 73.3% of respondents agreed or strongly agreed that disabled persons have access to interior amenities. Furthermore, 20% were neutral, whereas only 6.7% strongly disagreed. 53.3% disagreed or strongly disagreed that drinking fountains are available for disabled users. 40% were neutral, while only 6.7% strongly agreed, as seen in Figure 10.

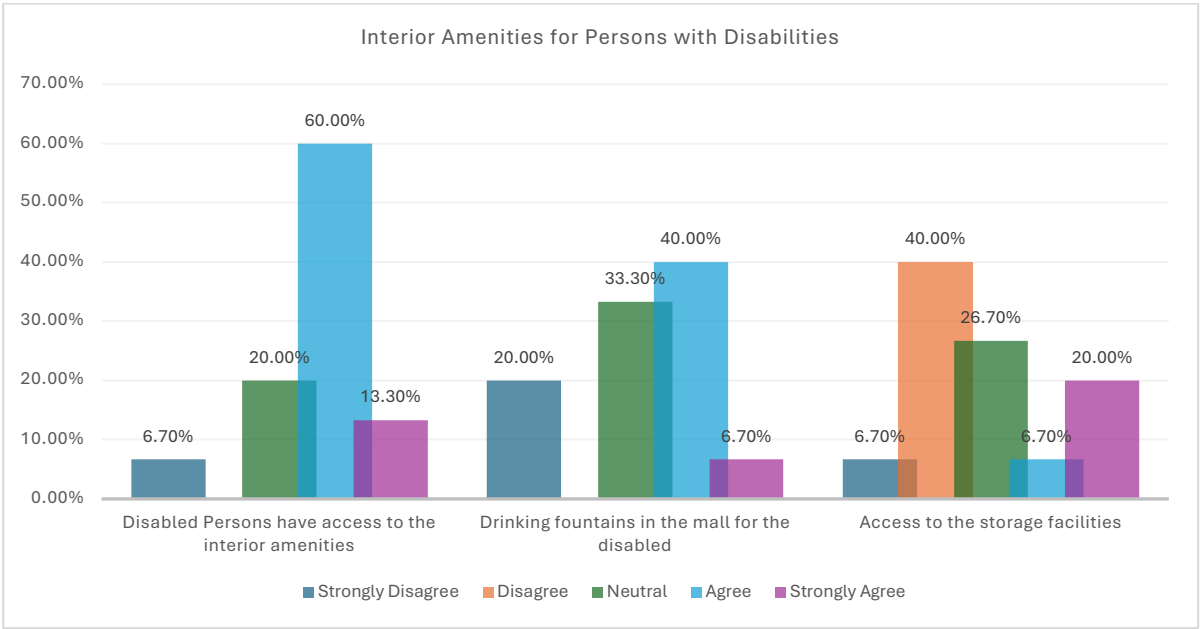

Figure 10. The state of interior amenities for PWDs (Source: Authors).

46.7% disagreed or strongly disagreed that PWDs have access to storage facilities. Meanwhile, 26.7% were neutral, and only 26.7% agreed or strongly agreed. Additionally, 20% reported the absence of restrooms for disabled individuals, as seen in Table 8. Furthermore, 26.6% were unsure or did not know, whereas only 26.7% confirmed the presence of 1–4 or more restrooms.

Table 8. Findings on restrooms for PWDs (Source: Authors).

Restrooms for PWDs	N	%
Not sure	2	13.3%
0	3	20.0%
1	2	13.3%
2	1	6.7%
4	1	6.7%
Depending on the capacity of the mall	1	6.7%
I don't know.	2	13.3%
More than 4	2	13.3%
The restrooms are available.	1	6.7%

4.1.4 Interior Systems and Controls

As shown in Figure 11, which focuses on interior systems and controls, the presence of audible and visual information systems revealed that 26.7% of respondents disagreed or strongly disagreed that these systems exist. Conversely, 40% were neutral, while only 26.7% agreed or strongly agreed. Furthermore, regarding communication systems and signals for disabled individuals in the mall, 33.3% disagreed or strongly disagreed about their availability. Meanwhile, 46.7% remained neutral, with just 20% agreeing or strongly agreeing. Additionally, 40% disagreed or strongly disagreed about the availability of information and directory systems within the mall; 46.7% were neutral, and only 13.3% reported observing these features in selected malls.

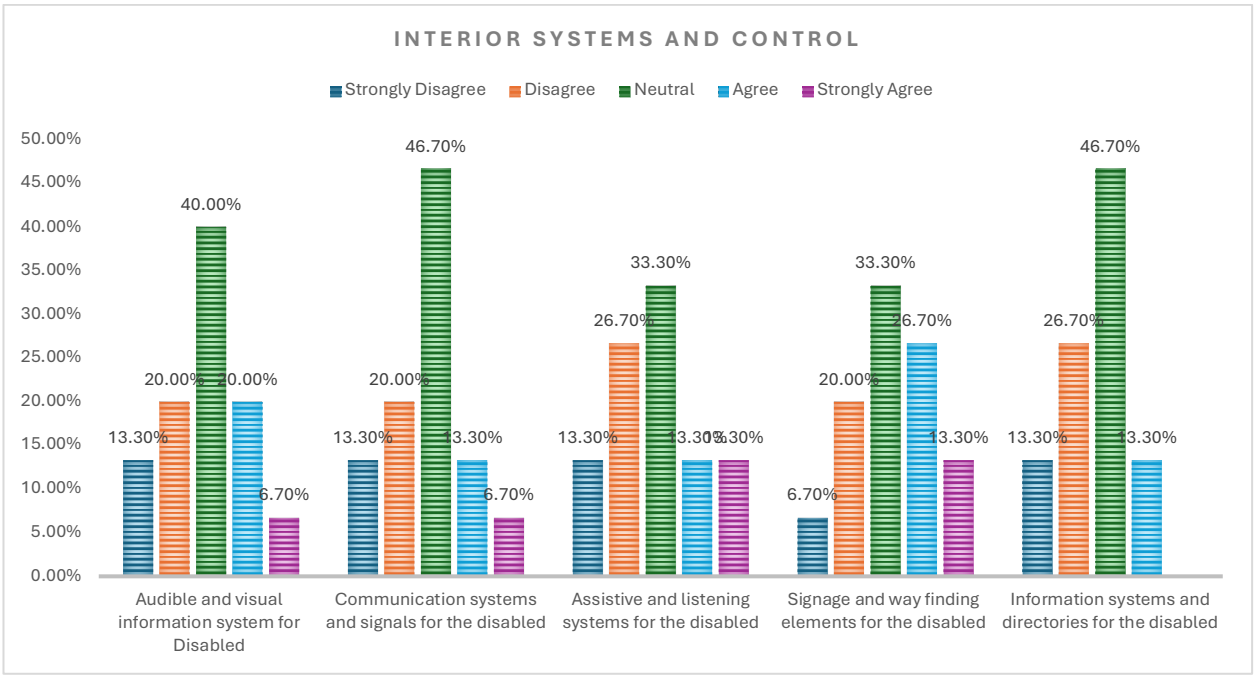

Figure 11. The level of interior systems and control in the malls (Source: Authors).

The presence of assertive and listening systems was seen to be limited, as 40% disagreed or strongly disagreed about their availability. Meanwhile, 33.3% were neutral, and only 26.6% agreed or strongly agreed. Furthermore, 26.7% disagreed or strongly disagreed regarding the presence of wayfinding elements within the assessed malls. Conversely, 33.3% were neutral, while 40% agreed or strongly agreed that signage and wayfinding elements are present, as shown in Figure 12. The availability of a

life safety plan for individuals with disabilities indicated that 60% of respondents were neutral about its existence. Additionally, 26.7% agreed or strongly agreed, whereas 13.3% disagreed.

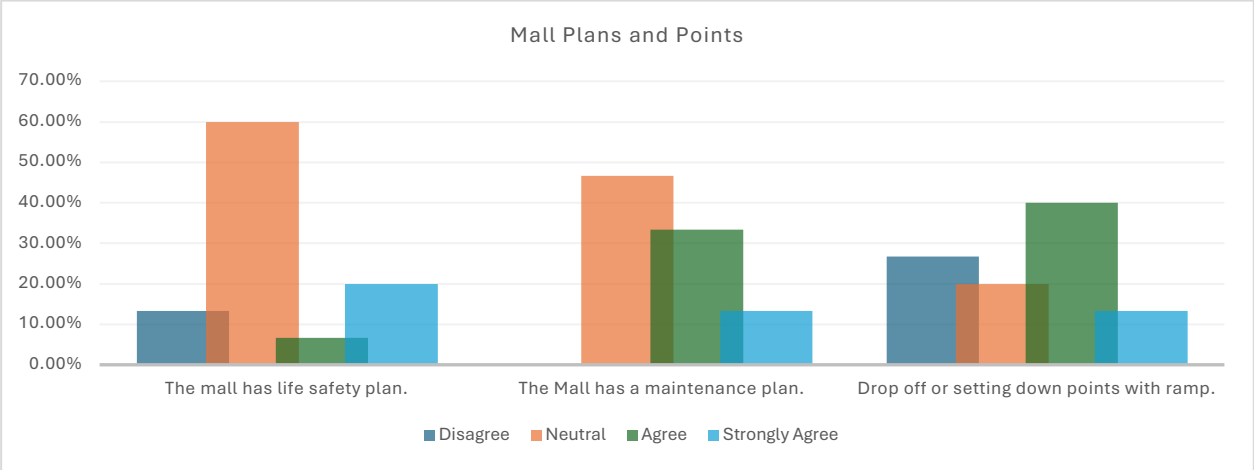

Figure 12. Availability of life safety, maintenance, evacuation, and operation plans of the malls (Source: Authors).

Regarding the availability of the maintenance plan, 46.7% were neutral, while 46.6% agreed or strongly agreed. However, 6.7% lacked system data. Additionally, 53.3% agreed or strongly agreed that drop-off or set-down points include a ramp. Meanwhile, 26.7% disagreed and 20% were neutral.

4.1.5 Exterior Routes

Assessing the exterior routes available at malls, it was found that 46.6% agreed or strongly agreed that there are elevation changes for disabled users. Furthermore, 40% were neutral, while 13.3% disagreed. Additionally, 53.3% agreed or strongly agreed that guards and handrails are present. Also, 20% were neutral or disagreed, as seen in Figure 13.

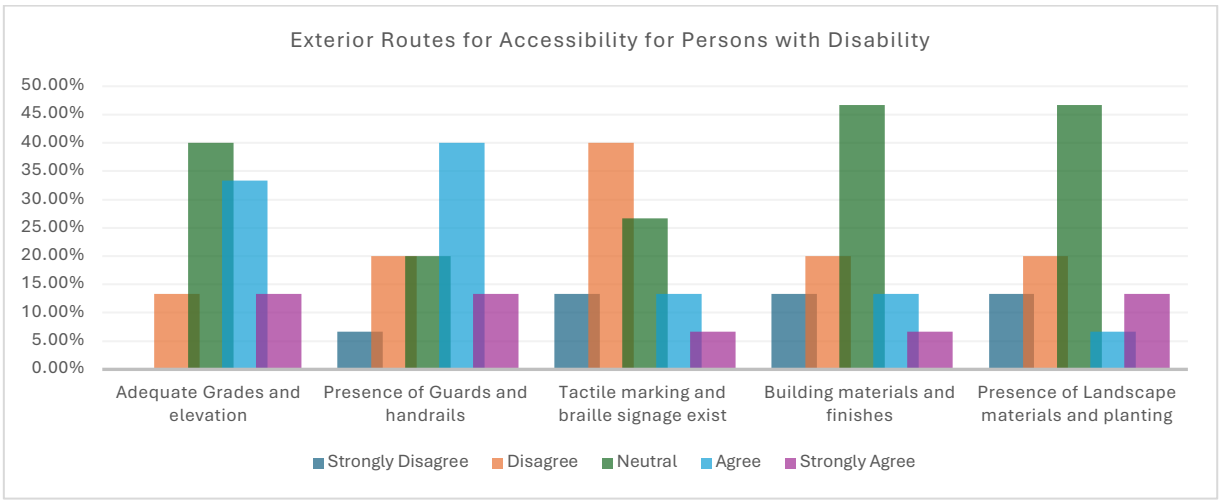

Figure 13. Accessibility aspects in the examined malls (Source: Authors).

However, 53.3% disagreed or strongly disagreed that tactile and Braille signage exists. 26.7% were neutral, while only 20% agreed or strongly agreed. Furthermore, 33.3% of respondents disagreed or strongly disagreed with the statement that materials enhance activities for disabled people. Additionally, 46.7% of respondents remained neutral, while only 20% agreed or strongly agreed. In summary, 33.3% disagreed or strongly disagreed about the presence of landscape materials and planting, whereas 46.7% were neutral. Only 20% agreed or strongly agreed.

The study also identified additional accessibility deficiencies at Priceless Stores, Okigwe Road, Imo State, where the entrance lacks tactile markings and Braille systems necessary for visually impaired users. Additionally, the mall's external environment lacks fundamental accessibility infrastructure such as zebra crossings, protected pedestrian routes, and designated boarding areas, indicating systemic neglect of inclusive external design.

Figure 14. Entrance porch of the mall devoid of tactile markings and the braille system (Source: Authors).

Figure 15. Access point to the mall's exterior environment without a zebra crossing, covered boarding and alighting area, as well as a protected pedestrian bridge, routes, signage, and buttons (Source: Authors).

5 Discussion

Findings from this study were compared with the Discrimination Against Persons with Disabilities Act. The Discrimination Against Persons with Disabilities (Prohibition) Act, No. 2, 2018 (hereinafter "the Act") is a landmark piece of legislation in Nigeria, aimed at eliminating discrimination and promoting the full integration of persons with disabilities (PWDs) into society. The Persons with Disabilities (Accessibility) Regulations, 2023 (hereinafter "the Regulations"), provide the specific technical standards and guidelines for achieving the accessibility mandated by the Act. They operationalise the Act's provisions.

5.1 Shopping Mall Access

While some malls have various circulation channels, a significant proportion still lack comprehensive internal navigation, which can hinder ease of movement, especially for users with mobility issues. Additionally, a third of malls do not have sheltered parking or pathways, exposing users—particularly those with disabilities or in bad weather—to discomfort and potential injury. There is also a notable gap in inclusive design. The absence of weather protection and signage for impaired individuals indicates a failure to adhere to universal design principles and accessibility standards.

Most malls feature large entry points, which facilitate accessibility, notably for wheelchair users and high foot traffic. However, the absence of self-closing swing doors may hinder access, especially for people with limited upper body strength or mobility disabilities. This deficiency in interior navigation and the lack of weather-protected routes in Nigerian retail malls align with findings from other developing regions where basic physical accessibility remains a challenge despite existing legal frameworks. For instance, a study of Malaysian shopping malls found that insufficient accessible paths and poor

weather protection affected shopper comfort and safety (Ezanee et al., 2011). This highlights a common shortfall in translating inclusive design concepts into practical, user-friendly solutions beyond merely providing wide access points, especially regarding ease of operation for all users (Hashim et al. 2018).

These findings highlight widespread non-compliance, especially with the spirit and specific regulations for accessible pathways, weather protection, and general building access. For example, Section 4 of the Act (Discrimination in Public Buildings) states: “A public building shall be constructed with the necessary facilities that make it accessible to persons with disabilities.” The findings regarding limited internal navigation, lack of enclosed pathways, and absence of weather protection directly violate this broad mandate.

The spirit of “necessary facilities” clearly includes unhindered movement and protection from the elements. Additionally, the Act, Section 6 (Accessibility of Public Conveyances and Facilities), states that “All public facilities shall be made accessible to persons with disabilities.” This emphasises the need for accessible walkways from parking areas to the building entrance. Likewise, Section 13 (Building Entrances and Exits) requires accessible entrances. However, the study's findings reveal large entry points and a lack of weather protection around these areas for disabled individuals, impairing their usability and comfort, thus contravening the principles of genuine accessibility. Section 25 (Doors and Doorways) indicates that although wide entry points are desirable, the "limited presence of self-closing swing doors" for people with weak upper body strength directly conflicts with the requirement for ease of operation. The regulations would specify the required operating force and clear opening widths. These findings demonstrate that the absence of weather protection (e.g., covered walkways from parking) directly compromises the "ease of access" principle by forcing PWDs to navigate adverse conditions, rendering the "accessible path” practically discriminatory. Additionally, limited internal navigation suggests insufficient clear floor space and obstacles.

5.2 Interior Routes

The absence of designated fire escape routes and inadequate signage posed serious safety hazards. It also reveals that emergency preparedness for impaired users is alarmingly insufficient, contravening fundamental accessibility and safety standards. Moreover, the presence of ramps in certain malls is positive, whereas their absence in others reflects uneven compliance with accessibility regulations. Handrails are crucial for safety and support, and their lack in over half of the malls signifies a major design flaw, especially for elderly or physically challenged visitors. This study indicates that people with disabilities face greater risks during evacuations due to inaccessible routes and inadequate communication systems, a problem not unique to Nigeria but prevalent in many public buildings worldwide (Karma et al., 2022; Turner et al., 2010). Furthermore, the inconsistent compliance with ramps and the notable absence of handrails reflected deficiencies identified in studies evaluating retail environments in other African and Asian countries, underscoring a persistent failure to provide essential safety and support structures (Marcussen, 2024; Badawy et al., 2020).

These findings reveal significant safety and navigation deficiencies that clearly violate key accessibility and safety standards. Section 4 of the Act (Discrimination in Public Buildings) imposes broad requirements for building accessibility. The absence of obvious spatial paths, handrails, and emergency facilities clearly fails to meet these standards. Furthermore, the Act, Section 5 (Building Accessibility Standards), states: “All public buildings, facilities, and utilities are to be made accessible to persons with disabilities within five years of the commencement of this Act.” The study findings (post-2018 Act) moderately indicate non-compliance with the general standards mandated within this timeframe. Additionally, Section 10 (Accessible Route) states that “Every accessible route shall be clear and unobstructed.” As a result, inconsistent spatial clarity directly contradicts the requirement for accessible paths to be "unobstructed" and "continuous." Furthermore, Section 17 (Emergency Egress and Refuge Areas) explicitly requires accessible fire escape routes, adequate signage, and arrangements for people with disabilities during emergencies. The absence of these features constitutes a serious and severe violation of regulations.

Section 19 (Ramps) specifies the maximum slope, width, and, importantly, the need for handrails on both sides of a ramp. The "absence of handrails in nearly half of the malls" represents a clear and widespread infringement. Additionally, Section 20 (Stairs) mandates the installation of handrails for safety and assistance. Moreover, Section 21 (lifts/elevators) describes the specifications for lifts as aids for elevation, including lights, call buttons, and interior space. The "high neutrality and disagreement" regarding lighting platforms or elevation aids indicates a failure to meet requirements for accessible vertical circulation. The findings thus reveal that the lack of specific fire escape routes and inadequate signage creates a discriminatory and life-threatening environment for PWDs, violating their right to safety.

5.3 Interior Amenities

The findings also indicated that most malls provide public access to interior amenities, showing a basic level of inclusion. However, neutral responses suggest that accessibility may not be consistent across all amenities or might be unclear in design, indicating that some amenities may still pose challenges for individuals with disabilities, such as poorly designed entrances or inadequate signage that fails to guide users effectively. Additionally, there is a noticeable lack of accessible hydration facilities. The high neutrality rate could be due to low visibility, insufficient signage, or poor design, all of which can discourage disabled individuals from using these services. Moreover, disabled people have limited storage access, which may affect their ability to safely store personal belongings or shopping bags. These issues pose a significant barrier to dignity and comfort for users with impairments. While there is a general level of broad facility access in Nigerian malls, the inconsistency and specific limitations in hydration, storage, and especially bathrooms are common findings in accessibility audits of public venues globally. Inadequate accessible lavatory facilities, in particular, remain a critical and dignity-threatening obstacle for disabled individuals worldwide, often due to a lack of space, grab bars, or clear signage (Ahuma-Smith et al., 2020; Áfio et al., 2016). The absence of inclusive hydration facilities and storage highlights a broader failure in universal design beyond primary circulation, compromising comfort and independence in auxiliary services.

While basic access may be available, the findings reveal a widespread lack of equal and functional access to essential amenities, which undermines dignity and independence. Section 4 of the Act (Discrimination in Public Buildings) states that "necessary facilities" must be genuinely accessible, not just present. Consequently, inconsistent accessibility, absence of hydration options, and limited storage or restroom access show that facilities are not truly "accessible". Moreover, Section 29 (Restrooms/Toilets) specifies standards for accessible restrooms, such as sufficient floor space, grab bars, accessible fixtures, and proper signage. Identifying "poor signage, lack of awareness, or inadequate lavatory infrastructure" indicates a serious and direct violation. Additionally, Section 30 (Drinking Fountains/Hydration) mandates accessible drinking fountains or hydration stations with suitable height and controls. The term "clear deficiency" suggests noncompliance.

Section 31 (Storage) revealed that, although not often a primary concern, storage for general users must be accessible to people with disabilities. Limited access to storage indicates a failure in universal design. This suggests that inadequate hydration and storage facilities hinder the independence and comfort of people with disabilities, forcing them to rely on others or leave the mall early.

5.4 Interior Systems and Controls

The findings showed that high neutrality and disagreement rates suggest that audible and visible systems are either missing, poorly designed, or challenging to identify. This limits access for individuals with hearing or visual impairments and reveals a gap in inclusive communication design. Additionally, the lack of clear communication methods such as visual alerts, tactile signals, or emergency devices hampers impaired individuals' ability to navigate independently and safely. The high neutrality rate may indicate insufficient exposure or a lack of user understanding. The absence of accessible directories and information systems, like tactile maps, Braille signage, or voice-activated kiosks, restricts

orientation and self-guided navigation, reducing independence and increasing reliance on others for help.

The high neutrality rate suggests that life safety plans are unclear, poorly communicated, or difficult for users. This raises concerns during an emergency, especially for disabled users who need clear evacuation procedures and identified exit routes. While nearly half of the respondents confirmed the presence of a maintenance plan, the substantial indifferent group indicates low public awareness or visibility. Regular maintenance is essential to ensure that accessibility features like ramps, lifts, and signage remain operational and safe. However, the presence of disagreement and neutrality suggests inconsistency or poor signage, which may hinder usability for impaired or elderly visitors, particularly in environments where accessible features are not adequately maintained or communicated.

The widespread lack of accessible audible and visual communication systems, tactile/Braille signage, and assistive listening systems in Nigerian shopping malls aligns with research showing significant global challenges in sensory accessibility in public spaces (Adewale et al., 2022; Wahyu et al., 2024; Douglas et al., 2025). These findings emphasise a critical gap in implementing a comprehensive inclusive communication design that also covers emergency preparedness, where inadequate life safety plans for disabled users are a common issue documented in various studies on public building safety protocols (Vaarula, 2023). The inconsistent quality of signage and low visibility of maintenance plans highlight systemic concerns in the ongoing management and communication of accessible features, as also noted in assessments of public infrastructure in other developing economies (Almklov & Antonsen, 2014), which can lead to confusion and increased risks for disabled users during emergencies.

These findings highlight significant gaps in information availability, communication, and emergency preparedness for people with disabilities, all of which are essential for independent navigation and safety. Section 35 (Audible and Visual Alarms) exemplifies the requirement for accessible audible and visual fire/emergency alarms. The discovery of systems described as "absent, poorly implemented, or not easily identifiable" reflects a direct failure in safety and communication. Section 36 (Signage and Wayfinding) also specifies the requirements for accessible signage, which may include tactile, visual, and auditory cues. "Inconsistent design quality, placement, and accessibility" constitute a clear infringement. As a result, the absence of tactile/Braille signage is particularly evident. Furthermore, Section 37 (Information Systems) details the needs for accessible directories, kiosks, and information points (such as tactile maps, Braille, and voice assistance), and the study's "absence" directly contradicts this.

The lack of multiple communication channels (visual, auditory, and tactile) creates an exclusionary environment, limiting the independence and safety of users with sensory impairments. To address the identified gaps in information accessibility, shopping malls should adopt multimodal wayfinding and communication systems that cater to diverse user needs. This includes the provision of tactile maps, Braille-labelled directories, and audible navigation systems at key decision points within the mall. Digital kiosks should be designed with screen-reader compatibility and voice-assisted interfaces, while public address systems should deliver clear and accessible auditory information. Integrating these features would significantly enhance independent navigation, reduce reliance on assistance, and align mall environments with universal design principles and international accessibility standards.

5.5 Exterior Routes

While over half of respondents identify elevation accommodations, the high neutrality rate indicates a lack of understanding or inconsistency in design. The absence of tactile and Braille signage severely limits navigation for visually impaired people, highlighting a critical gap in sensory-inclusive design that breaches universal accessibility standards. The high neutrality and disagreement rates imply that mall construction materials may not facilitate safe and comfortable movement for disabled individuals. These should include non-slip surfaces, seamless transitions, and tactile contrasts. The absence of

tactile cues, in particular, remains a significant barrier for visually impaired users in public navigation worldwide (Real & Araujo, 2019). Moreover, concerns regarding non-supportive construction materials (e.g., non-slip surfaces and smooth transitions) and the underutilisation of landscaping elements for accessibility echo studies criticising the practical implementation of universal design in public outdoor spaces, emphasising that such elements are vital for safe movement and comfort but are often overlooked (Kullmann, 2014; Chen, 2024).

This revealed that landscape features, including textured walks, shaded rest areas, and sensory gardens, are either absent or underused. This decreases outdoor accessibility and comfort for disabled individuals, especially those with sensory or mobility challenges. These findings highlight significant issues in external design, creating barriers from the moment a user approaches the mall. For instance, Sections 4 and 5 of the Act require accessible public buildings and amenities, including entrances. Section 10 (Accessible Route) specifically covers outdoor paths leading to the building. Consequently, inconsistent elevation adjustments, inadequate material choices (such as non-slip surfaces and smooth transitions), and the absence of railings all fail to meet safety and accessibility standards for external routes. Additionally, Section 19 (Ramps) stipulates that drop-off zones with ramps must meet specific slope, width, and handrail criteria and be clearly marked. The phrase "inconsistent implementation or poor signage" indicates non-compliance. Furthermore, the "absence of tactile and Braille signage" on external routes clearly breaches the standards for comprehensive wayfinding for visually impaired users outlined in Section 36. Section 14 (Exterior Spaces and Landscaping) also addresses the criteria for accessible landscaping features, such as clear pathways, seating, and sensory considerations.

The presence of "largely absent or underutilised" features indicates a failure to create an inclusive exterior environment. This means that the lack of tactile/Braille signs forms a barrier for visually impaired individuals, making autonomous navigation outside the mall impossible.

4.1 Global Implications of Findings

The findings of this study have important global implications that extend beyond the Nigerian context and contribute to the broader discourse on accessibility, inclusivity, and sustainable urban development. The persistent accessibility gaps identified in Nigerian shopping malls mirror challenges experienced in many developing countries, where the implementation of accessibility legislation often lags behind policy formulation. Despite global recognition of disability rights through frameworks such as the *United Nations Convention on the Rights of Persons with Disabilities (CRPD)* and the *Sustainable Development Goals (SDGs)*, particularly Goal 11 on inclusive cities and communities, the practical integration of universal design principles in commercial architecture remains inconsistent worldwide. This study therefore reinforces the notion that accessibility must move from policy rhetoric to tangible, enforceable design practice.

Globally, the research points out the need for countries—especially in the Global South—to bridge the gap between legislative intent and architectural implementation. Many nations face similar barriers to those observed in Nigeria, including weak institutional enforcement, inadequate professional training, limited funding, and low public awareness. The study highlights that without robust monitoring mechanisms and the inclusion of individuals with disabilities in design and planning processes, even well-intentioned policies fail to produce truly inclusive built environments.

The findings also have implications for global architectural education and practice. They call for an international shift in architectural pedagogy—one that integrates accessibility and universal design as core components of professional training rather than optional subjects. Such reform would equip future architects, planners, and engineers with the competence and ethical commitment to create inclusive environments. This study adds to the growing body of evidence around the world that accessibility is not just a moral or social duty but also an economic and environmental issue. Inclusive commercial facilities, such as shopping malls, attract broader customer bases, enhance user satisfaction, and

increase economic participation among individuals with disabilities, thereby supporting inclusive growth and local development.

Despite the effort to comprehensively audit shopping malls across Nigeria, the study is subject to certain limitations. The use of a non-probability (convenience) sampling approach and a relatively small sample size of fifteen malls may limit the generalisability of the findings to all shopping malls in Nigeria. However, the selected cases were distributed across multiple regions and mall typologies to enhance representativeness within practical constraints.

Furthermore, the study did not incorporate direct input from people with disabilities (PWDs), which limits the depth of user-centred insights and the ability to fully capture lived experiences with accessibility barriers. While the structured questionnaires provided useful perception-based data, they may not adequately reflect the nuanced challenges faced by PWDs in navigating mall environments, such as difficulties in physical access, sensory overload, and social stigma that can impact their shopping experience. Future research should therefore adopt mixed method approaches that integrate qualitative techniques, including interviews, focus groups, and participatory design engagement with PWDs, to provide a more comprehensive understanding of accessibility in the built environment.

6 Conclusions

This study set out to evaluate user accessibility in Nigerian shopping malls with reference to the Persons with Disabilities (Accessibility) Regulations, 2023, and to assess users' perceptions of accessibility features within these facilities. Using a quantitative research design that combined field observations and structured questionnaires across fifteen shopping malls in different regions of Nigeria, the study successfully addressed its objectives. The findings revealed attention on physical accessibility, with some malls featuring ramps, and most of them lacking in the provision of drop-off or set-down points, which are a key requirement for accessible public buildings as specified in Regulation 160 of the Persons with Disabilities (Accessibility) Regulations (2023). This regulation outlines the provision of designated drop-off zones with safe gradients, kerb ramps, and direct access to building entrances to facilitate ease of movement for persons with disabilities.

The study results buttress the fact that mobility disability is prioritised over other forms of disabilities such as blindness, deafness, mental impairment, etc.; hence, there was a dearth in accessibility features thereof. Invariably, less attention is given to digital accessibility and information accessibility in the malls, as features such as public address systems, tactile markings, Braille systems, assistive listening systems, and audible and visual information systems were deficient. Moreover, the study revealed that essential accessibility features like safety plans, evacuation plans, well-articulated mustering strategies, and maintenance manuals, among others, were deficient in the malls. Inconsistent circulation layouts, inadequate emergency egress routes, and the absence of maintenance plans for accessibility facilities underscore widespread non-compliance with both national accessibility regulations and universal design principles.

Overall, the study confirms that user accessibility in Nigerian shopping malls remains inadequate and unevenly implemented, suggesting that inclusivity in these public spaces is more theoretical than practical. These shortcomings call attention to the urgent need for stronger institutional enforcement, increased professional training, and proactive design interventions to achieve genuinely inclusive and barrier-free environments.

The study recommends continuing awareness and sensitisation programmes to promote user accessibility within communities. These could take the form of workshops, town hall meetings, lectures, and seminars presented in clear, easily understood language to reach diverse audiences, including local stakeholders and policymakers. Furthermore, the National Commission for PWDs should have units (offices) in all 36 states of Nigeria, including the Federal Capital Territory [FCT], at their respective physical planning and development boards. This unit shall be called the Accessibility

Audit and Compliance Unit [AACU], as well as function in accordance with regulation 165 for an accessible built environment. This unit shall be laden with the responsibility of ensuring the new and existing developments conform to the PWD's regulations throughout their life cycle. Moreover, it shall periodically assess these developments to sanction or seal off malls that do not meet the required accessibility features, as well as certify those that comply with the necessary standards. Through the unit, the commission shall monitor and enforce regulations across the country, as well as conduct programs and training in the respective states.

In addition, the research points to the value of incorporating education on accessibility and universal design into the curricula of secondary schools and higher institutions. These programs should include practical components and direct engagement with PWDs to enhance empathy and understanding among future professionals. This includes workshops, internships, and collaborative projects that allow students to work alongside individuals with disabilities. Importantly, the National Commission for PWDs should periodically organise and publicise its training for all players in the built environment to participate. Thus, certifications in that regard should be a prerequisite for holding any office or performing any official duties thereto.

To solidify the implementation of the PWDs regulations, the Commission should synergise with the Corporate Affairs Commission [CAC], banks, and allied agencies/bodies to ensure individuals opting for business registration or corporate accounts present the National Disability Compliance Certificate [NDCC] as a mandatory deliverable required thereto. In general, the NDCC should be a mandatory pre-qualification document for bidding on procurement of private/public works, goods, and services.

In order to ensure all buildings provide features for PWDs, all professionals in the built environment submitting construction documentation to the physical planning and development board in respective states should be mandated to present their NDCC during the approval process for private and public works. Hence, the operation ‘leave no one behind’ should be established with a sizable workforce deployed to the AACU. This initiative shall be characterised by sequential accessibility auditing of all developments in respective states to ensure they meet standard requirements as contained in the regulation.

Future research should also focus on longitudinal surveys and continuous monitoring of accessibility features in shopping malls. Regular feedback from PWDs, architects, researchers, and other stakeholders should be collected and evaluated to improve accessibility policies and design practices. Public–private collaboration is particularly crucial in sustaining research and awareness initiatives and ensuring that the *Persons with Disabilities (Accessibility) Regulations, 2023,* are effectively implemented and periodically reviewed. This research makes an important contribution to the discourse on inclusive architecture and urban development in Nigeria. It provides empirical evidence of the current state of accessibility in commercial facilities and serves as a benchmark for architects, planners, developers, and policymakers committed to inclusive design. Identifying key gaps and proposing practical recommendations, the study supports Nigeria’s efforts to achieve the United Nations Sustainable Development Goals, particularly Goal 11 on sustainable cities and communities. Ultimately, the study emphasises that creating accessible shopping malls is not only a legal or architectural requirement but also a moral and social responsibility.

Ethical Approval Declaration- Informed Consent Statement

The study adhered to the ethics guidelines of the Niger Delta University, Yenagoa, Nigeria, Research Ethics Board and followed the Declaration of Helsinki—principles of informed consent, voluntary participation and withdrawal, confidentiality, and privacy of the participants. The authors confirm they sought and got informed consent from all participants in the study.

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Data Availability Statement

The data presented in this study are available on request from the first-named author.

Conflicts of Interest

The authors declare no conflict of interest.

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