Accessibility and Satisfaction by People with Disabilities in Public Transportation Terminal in Kaduna State Nigeria

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ABSTRACT

Using people with disabilities (PWDs) in public transit motor park (MP) in Kaduna State, Nigeria, to demonstrate the level of service in all facilities. This research examines the experiences of marginalized PWDs and the influence on their lives and well-being. The study began with the distribution of questionnaires using a qualitative technique to determine PWDs' perspectives on various amenities. This article first describes the challenges that people with disabilities face in the transit network (from physical to social), as well as the primarily negative emotions that these barriers elicit. The findings revealed that ramps, stores, and platforms produced the lowest value of all the studied facilities, while parking lots and staff services produced the highest values. As a result, on the numerous terminals evaluated, Kawo MP and Kachia MP provided better services, whereas Badarawa MP and Makarfi MP had the lowest ratings. The study then encouraged the development of problem-solving approaches to help PWDs overcome the limitations they experienced. Finally, this article outlines the consequences for the transportation system if such challenges are not addressed, as well as some long-term solutions such as redesigning with new features, government policy inclusions as a potential network element, and improvements to bus terminals.

Keywords: Bus terminal, level of service, PWDs, facilities, improvement

INTRODUCTION

Inadequate public transport services have generated significant problems and prevented many people with disabilities (PWDs) from moving as intended. The built environment must be barrier-free and adjusted to satisfy everyone's needs equitably. According to Ghosh et al., (2017), accessibility is about providing equal access to everyone, and people with disabilities can never be completely integrated if they don't have access to resources and services. Inefficient accessibility in public transport terminals has caused discomfort and prevented many disabled people from going freely. According to Zainol et al., (2018), one of the most major barriers to people with disabilities fully engaging in society is their inability to access the built environment. Wu et., al (Wu et al., 2020), states that the simplest method to increase public transportation utilization is to create an environment in which pedestrian access is safe, convenient, and comfortable.

Since the disabled are regarded as a group of persons who would struggle to access the environment, efforts have been undertaken to determine the elements affecting their accessibility to public transit terminals(Zainol et al., 2018)(Hu et al., 2013)(Wojuaden & Badiora, 2017). According to Cerdan Chiscano (Cerdan Chiscano, 2021), the current provisions are insufficient and inhospitable to people with disabilities. The work emphasized that people are becoming more conscious of the disabled, especially in developed nations. Additionally to Wu et al., (2020) supported the claim that individuals with impairments have not received equitable treatment. They made the argument that, in contrast to regular people, people with disabilities are special and have limitations when it comes to using the built environment. As such, they require more attention from society.

There is not enough study on the open environment and the accessibility of public transit stations for people with disabilities. Thus, the goal of this study is to examine how to construct infrastructure for people with

disabilities, particularly when it comes to transportation terminals. This is to guarantee that everyone can access public transportation terminal buildings and to make the environment more accommodating to people and organizations with lower environmental competency levels. The purpose of the study is to illustrate the effects of existing laws and guidelines for the design of accessible public transit stations. The research's specific goals are as follows:

1. To indicate and draw attention to the areas in the transportation terminals that are accessible.
2. To assess how the transit terminals' interior infrastructure impacts the accessibility of people with disabilities.
3. To make suggestions for enhancing the terminals' accessibility for people with disabilities.

The term "disabled" will be used in this study in accordance with Hranický et al., (2021) Code on Accessibility in the Built Environment, which defines the term as "those who have a consequence of physical disability or impairment." Disabled people can be categorized according to their physical surroundings as wheelchair-bound, ambulatory, sensory, or temporary (Ipingbemi, 2015). The journey cycle standard for every commuter including disabled people is shown in Figure 1. Based on the breakdown above, this study examines the external environment and internal terminal ranging from parking lot, buying ticket(s), staffs services, waiting at the terminal, information, bus structures. When reviewing accessibility for the disabled in public transport terminals, there are several factors that need to be taken into consideration in order to get the correct picture of the enhanced bus terminal. It is important to consider the journey cycle for a better understanding and experience the entire journey of accessibility for disabled people, as well as the issues these individuals face.

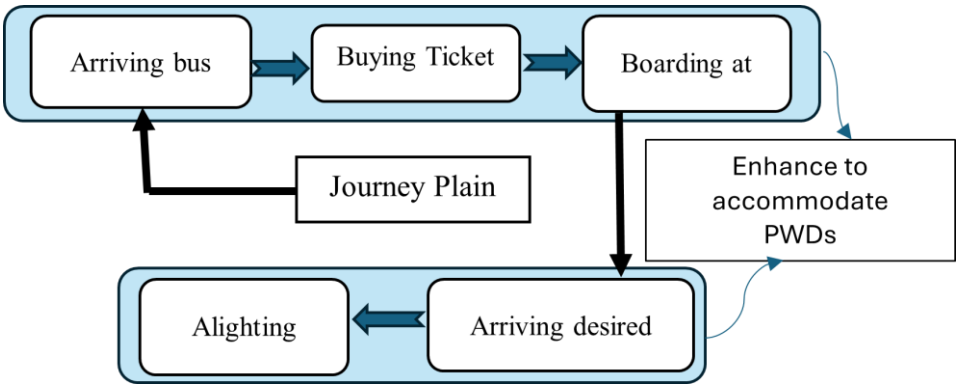

Figure 1: Transportation cycle

Study Design

The study used a cross-sectional survey design that focused on quantitative data. First, a visit was made to all the five (5) bus terminals in the state for accurate compilation of information. The quantitative data was acquired using the questionnaire employed in the study. A total of 1000 participants were chosen for both oral interviews and questionnaire administration in five (5) terminals throughout all the state senatorial zones, with 200 respondents bus terminals. The primary data was gathered from the answers of PWDs within the bus terminal. Subordinate data were collected from publications such as textbooks, journals, and reports.

Research Size and Sampling Procedures

The sample comprises of PWDs aged 18 and up, which is the age of maturity. PWDs from each bus terminal were interviewed, including both males and females who live in the study region. The study included 600 men and 400 women, chosen at random. A total of 1000 questionnaires were distributed to the respondents in the various bus terminals of the Kaduna state.

Demonstration of Questionnaire

The questionnaire was disseminated in the form of a five-point Likert scale questionnaire; a five-point module was chosen in order to create symmetry in the responses as well as an equidistant measure between them

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across the seven selected bus terminals. Across the senatorial district as presented in Table 1. The responses were classified as follows: Excellent = 7, highly agreed = 6, averagely agreed = 5, slightly agreed = 4, neutral = 3, disagreed = 2, and severely disagreed = 1. This design was in line with previous research (UNISDR, 2014). Thus, the coding was done in a regressive form from 5-1, with the response more away from 5 closing on 1 indicating the more negative the reaction, and the response closer to 5 indicating the more positive the response.

Table 1 Presentation of Questionnaire Response Date

IDP camp	Kawo MP	Mando MP	Makafi MP	Kachia MP	Badrawa PM	Total
Valid	165	183	188	191	143	870
Invalid	35	17	12	9	57	130
Total	200	200	200	200	200	1000

RESULTS AND DISCUSSIONS

The focus of the study was to assess the level of services for PWDs various bus terminal architecture within the Kaduna State as presented in Figure 2. According to the findings, Figure 2 shows that, in all bus terminal locations, the absolute numbers of female commuters are typically lower than those of male commuters.

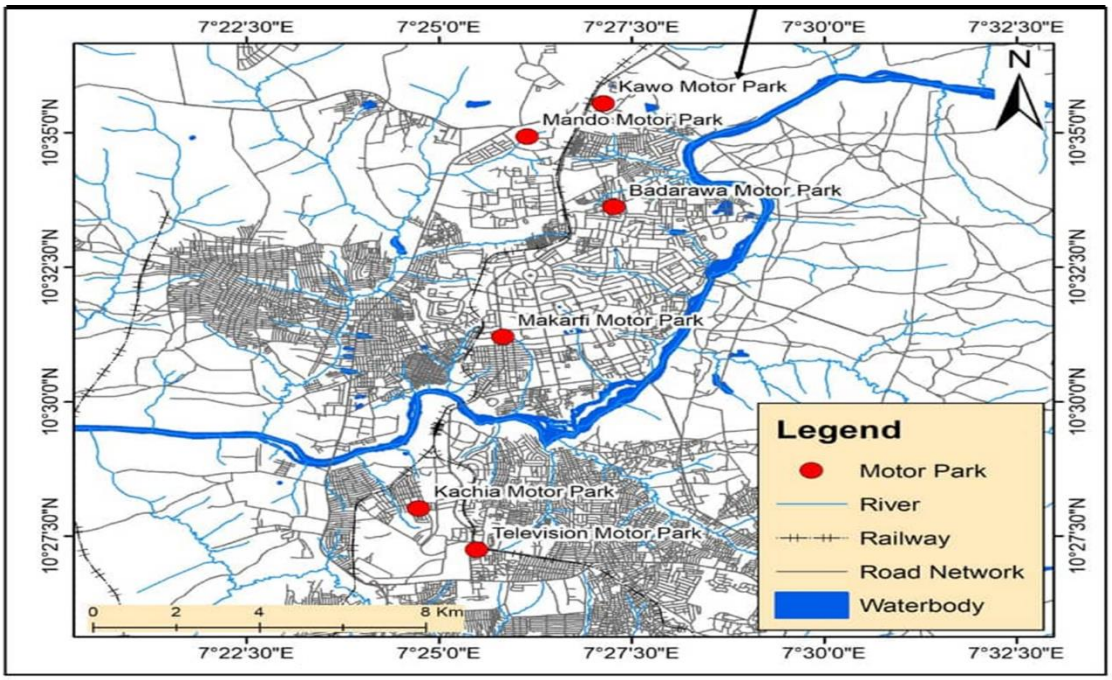

Figure 2: Terminal used in the study

According to insights from Percentage Distribution, taking largest group (40-59), at 30%, this middle-aged group likely plays a crucial role, such as being a significant part of the workforce or consumer base. In terms of policy, this group may require resources for healthcare, mid-career training, or family support. Youthful Demographic (28 & below/40), At 25%, the younger group represents a substantial part of the population. Investments in education, skill development, and employment opportunities are critical for this group. The outcome of this research is similar to the previous work (Hranický et al., 2021).

Older Population (60 & above) with 25%, represents a significant proportion, signaling potential healthcare and retirement needs. A population with a large senior percentage might experience a higher dependency ratio. Smaller Young Adults (29-39): At 20%, this could suggest a smaller pool of prime working-age individuals, which might challenge economic productivity if the trend persists. According to findings, key observations

based on balance were if percentages are evenly distributed (e.g., each group near 25%), the society or dataset reflects a balanced demographic. However, skewed distributions (e.g., one group at 40% while others are below 20%) would indicate a lopsided population dynamic, necessitating focused interventions.

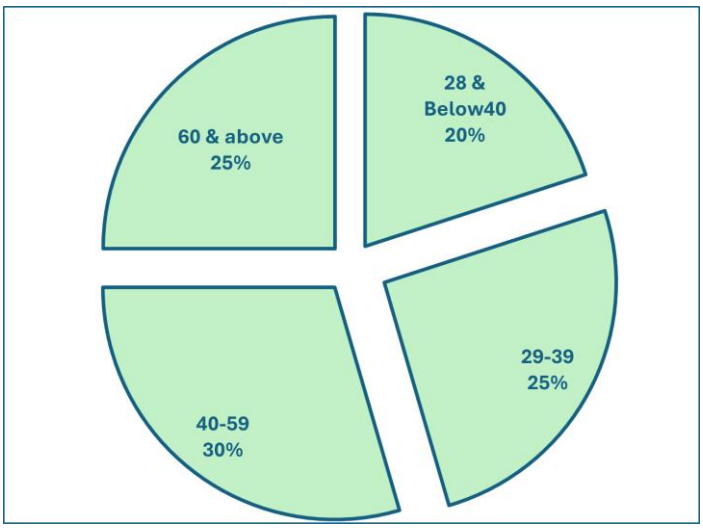

Figure 2: Study demographic pattern

Figure 3 shows the results based on the accessibility factor of disabled services offered at public transportation terminals: Platforms rank lowest among all infrastructures, followed by ramps, steps, and walkways; these basic infrastructures were poorly designed for commuters with disabilities in both case study areas; however, waiting areas, restrooms, and escalators are quite friendly and were rated higher by the disabled. For both non-disabled and disabled people, the common infrastructures listed above are generally better served. In this study, it was discovered that PWDs were more satisfied with more dimensions than others. On the other hand, car parking, facility and service quality, and station cleanliness/maintenance were all modestly satisfied. In terms of the components examined the findings of this study contradicted those of the literature (Ghosh et al., 2017).

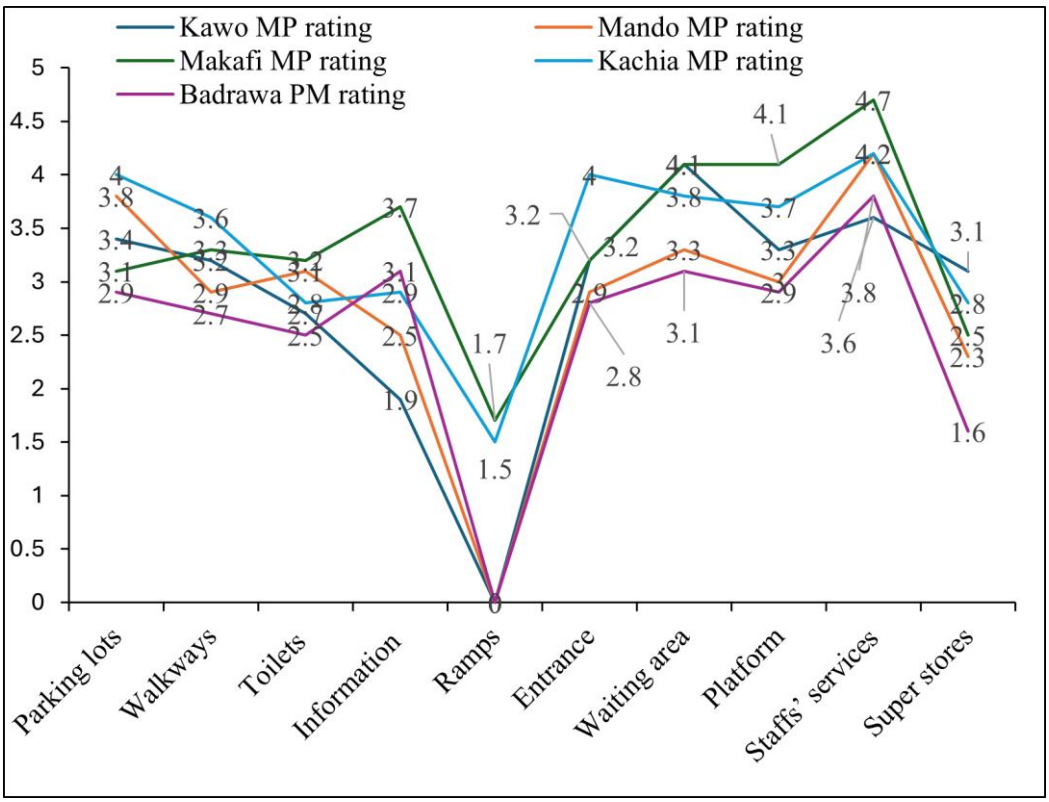

Figure 3: Facilities rating in the various bus terminal

To get the better understanding of accessibility for disabled, the questionnaire for level of safety were formulated to highlight the important of the journey cycle among the public transport commuters. Figure 4 provides the feeling of safety for the breakdown of the journey cycle. These were emphasized as follows to determine the satisfaction level towards the current facilities provided. This Figure 3 presents ratings across five locations (Kawo MP, Mando MP, Makafi MP, Kachia MP, and Badrawa PM) for various aspects of public transportation infrastructure. Ratings appear to be on a numerical scale (likely 1–5, with higher numbers indicating better ratings). Walking to and from the terminal. Observation: Scores for this category are relatively low and close across locations, indicating that walking safety or ease of access is an area of general concern. Factors like poorly maintained pathways, lack of pedestrian signage, or insufficient lighting may contribute to this perception. Under buying tickets, the study observed that the bus stations consistently score poorly, especially in Badrawa PM (2.3). Mando MP performs slightly better, but overall, the low scores suggest issues like long queues, unorganized systems, or unfriendly staff. Automation or digital ticketing systems may be limited or absent.

Locating the Needed Service, this is one of the better-rated categories, with Badrawa PM (3.9) scoring the highest. This suggests some level of clarity in signage or helpfulness of staff. However, even the highest score (3.9) is not exceptional, meaning there is room for improvement in navigation and information systems across all locations. For boarding, Mando MP and Kachia MP perform notably better than other locations in this category. Factors contributing to better boarding experiences could include well-managed queues, organized platforms, or adequate staff assistance. However, Makafi MP (3.3) reflects boarding difficulties, such as crowding or lack of facilities. The observation from this present research is similar to previous research (Ipingbemi, 2015)(Soltani et al., 2012).

Environmental Neatness among the various bus terminals varies significantly across locations. Kawo MP is rated the cleanest, while Badrawa PM (2.9) is perceived as untidy. Cleanliness could influence the overall experience and safety perceptions of travelers, and thus, maintaining better hygiene at low-performing stations is essential. Meanwhile, the availability of wheelchairs users is the most poorly rated aspect overall. Even the highest score, 3.1 (Mando MP), is below average, indicating widespread inadequacies. These could include a lack of wheelchairs, poor design of ramps, or untrained staff to assist travelers with mobility challenges

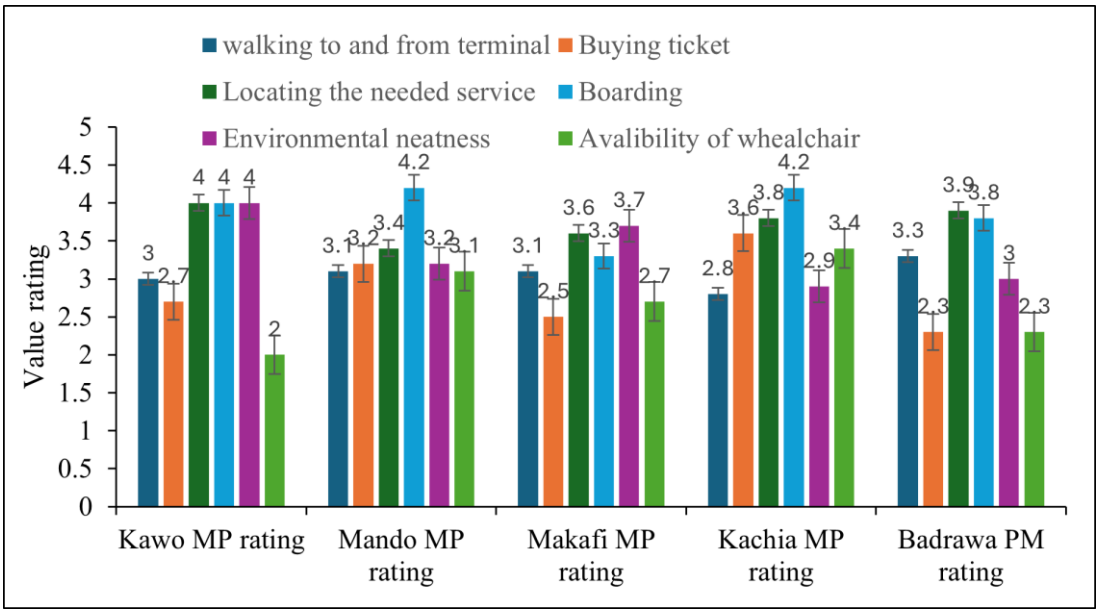

Figure 4: PWDs (respondents) feeling on various provisions in the terminals.

According to the data presented in Figure 4, most commuters feel uncomfortable with the current infrastructure. This pertains to objective number one and two, which is to identify and highlight accessibility when approaching the places in the transportation terminals as well as the interior facilities. The researcher discovered that going to and from the terminal, as well as boarding and disembarking from the chosen public

transportation, are the most important aspects of this study, thus related with previous report (Yao et al., 2012)(Mun et al., 2019). One implication of this result is that disabled who showed a higher degree of discontent with the facilities supplied tend to show a higher level of unsafe when utilizing the facilities. As a result, building design should prioritize the inclusion of disabled people in physical contexts. As a result, it has become increasingly necessary to recognize their needs, particularly when accessibility.

The level of service (LOS) for persons with disabilities (PWD) at transit terminals is influenced by several factors, many of which stem from systemic shortcomings in infrastructure, communication, and staff training. For individuals with hearing impairments, such as members of the Deaf Association, the lack of visual announcements and inadequate signage poses significant challenges. Communication barriers are compounded by the limited awareness and absence of sign language skills among staff, which restricts effective interaction. Similarly, the Blind Association reports that tactile and audio support systems, such as tactile paths and functional audio announcements, are either non-existent or poorly implemented. Obstructed walkways and poorly marked elevators further impede accessibility, while limited staff training and insufficient rights awareness aggravate these issues. This findings were similar to investigation conducted on terminal LOS (Correia et al., 2008)(Chang & Chen, 2011).

A more holistic perspective is provided by the Joint National Association of PWDs, which highlights the widespread neglect in infrastructure design and the lack of inclusive services across transit terminals. Minimal enforcement of accessibility practices further undermines the LOS for PWDs with diverse needs. The challenges are even more pronounced for individuals with multiple disabilities, as noted by the Multiple Disabilities Association. Barriers such as narrow doorways, inaccessible restrooms, and the absence of tailored support systems reflect significant gaps in addressing compounded disabilities. Inadequate training for staff to handle these complexities exacerbates the problem. Furthermore, focus groups on their opinion decided on PWDs according to several categories, as shown in Table 2, thus supporting prior findings (Zainol et al., 2018)(Petz, 1993)(Wu et al., 2020).

Table 2: Challenges and Accessibility Gaps in Transit Terminals as Identified by PWD Associations

S/N	Association	Focus	Challenges at Terminals	Accessibility Issues	Awareness/Training Gaps
1	Deaf Association	Inclusive communication systems	Lack of visual announcements, inadequate signage	Ramps exist but lack tactile guides; poor lighting for announcements	Minimal awareness of PWD needs; staff lack sign language skills
2	Blind Association	Tactile and audio support	No tactile paths, non-functional audio announcements	Poorly marked elevators, obstructed walkways	Limited training to guide visually impaired; inadequate rights awareness
3	Spinal Cord Injury Association	Wheelchair-friendly infrastructure	Steep ramps, inaccessible restrooms, no wheelchair-friendly platforms	Poorly designed ramps, non-functional elevators	Staff unaware of assisting wheelchair users; poor understanding of accessibility
4	Physical Challenge Association	Inclusive infrastructure	Non-accessible restrooms, lack of adjustable ticketing counters	Obstructed walkways, inconsistent levelling	Limited staff knowledge, insufficient enforcement of PWD-friendly policies
5	Albinism Association	Anti-discrimination policies	Lack of UV-protective shelters, poor visibility of signage	Shelters poorly designed, no sun-protective infrastructure	Neglect of unique needs; limited awareness of albinism-related challenges

6	Lepers Association	Inclusive health and transit services	Uneven surfaces, limited acceptance by staff and public	Poorly maintained tactile paths, absent reserved spaces	Discriminatory attitudes among staff; misconceptions about lepers persist
7	Joint National Association	Holistic accessibility improvements	Neglect in infrastructure design, lack of inclusive services	Poor or unavailable facilities	Minimal enforcement of PWD-friendly practices
8	Multiple Disabilities Assoc.	Multi-faceted support	Lack of tailored systems for people with multiple disabilities	Barriers in restrooms, narrow doorways	Insufficient training for handling complex disability needs
9	Women Wing of PWD Assoc.	Empowerment of women with disabilities	Gender-specific issues like lack of privacy, safe spaces, and tailored assistance	Non-inclusive waiting rooms, inappropriate seating arrangements	Gender-biased attitudes and limited sensitivity training

Expected facilities for bus terminal enhancement for PWDs

Handrail and tramway infrastructures are relatively new, therefore accessibility should be a non-negotiable design condition. Because these transit systems travel at modest speeds, level boarding is simple. The gap between the platform and the train can be closed, and wheelchair users would have more space to move about. However, there are still examples of tramway systems during a major road, requiring passengers to cross multiple lanes of traffic to reach them. This position is hazardous to everyone and frequently difficult for people with low vision, for example. Old tram systems with high floors and street-level boarding pose a far greater accessibility barrier. However, many people can gain easier access with basic, low-cost changes such as color contrast on step edges and handholds at the entry as presented in Figure 5. Incorporating accessibility provisions into new systems is reasonably simple as long as individuals with disabilities are properly consulted and engaged. Retrofitting accessibility features into older systems, on the other hand, is more complex and costly.

Figure 5: Important facilities in the terminal for PWDs in Kaduna bus terminals

As a result, new systems must be carefully developed and built so that future modifications to make them accessible are not required. However, older systems can be upgraded. As indicated in the London Underground photo, one piece of the platform has been lifted to allow for level boarding between station and train. Clear

color contrast and a tactile warning strip along the platform edge are critical safety and navigation features for all passengers, including those with disabilities. A ramp or lift is often necessary to allow wheelchair users to board trains, but there may be a gap between the platform and doorsill. There are instances all across the world of boarding systems that are stored either on the station platform or on the train. This Norwegian example shows a lift installed in the train's doorway. The preferred solution is to design and build level access between platform and station.

Suggestions for the Transport Sector

The requirements and wishes indicated by people with disabilities in the GAATES study have repercussions for the transport industry.

1. Laws and regulations aimed at making vehicles and systems more accessible to people with disabilities fall short of ensuring mobility.
2. Mobility must be addressed at the most fundamental level by ensuring proper access for wheelchairs and other mobility equipment, as well as designing and building streets and pavements that allow people with disabilities to move around safely, in comparison to the literature.
3. Standards must be established for the design and operation of accessible vehicles. These standards, as well as overarching legal requirements, must be monitored and implemented, with appropriate fines and corrective actions, to ensure that investment in disability-inclusive transportation is effective.

CONCLUSION

Several research investigations have concentrated on the disability study. However, less research has been conducted on specific sites, such as public transit terminals. Public transit provides as a link between communities, allowing people to commute on a daily basis, particularly those with modest incomes. According to the findings, adults, the majority of whom are working individuals, were the highest disabled public transport commuters in these two areas, while wheelchair-bound disabled people still believe that there are many improvements that can be made to satisfy their needs in the current facilities. The findings indicate that significant efforts by government bodies are required, as well as a high demand for re-designing current facilities, so that the disabled community can feel more accepted in society and increase their equality and accessibility in Kaduna State.

This study would considerably promote and develop public buildings for higher value by focusing on disabled-friendly facilities and design, so improving the friendliness atmosphere of public transport terminals for better usage and accessibility. The primary goal of this research is to develop a better relationship between people with disabilities and typical individuals. To achieve a successful design for the physical environment, this study proposed that local authorities should play a key role in creating the ground and setting standard standards for constructing the public amenities so that all can have equitable access.

Evidently, design has a significant role in making a building accessible, which will immediately prohibit some people from using it. Kaduna's public transport understanding of disability issues lags that of other Nigerian states. It can help raise awareness among designers and architects about the need of accessibility while designing. This is because the most important feature of the study is to minimize bad planning and decision-making, particularly during the early stages of infrastructure design for public transit terminals. Finally, it is critical for this study to fully understand the relevance of accessibility in the physical environment, particularly for those with impairments.

REFERENCES

1. Cerdan Chiscano, M. (2021). Improving the design of urban transport experience with people with disabilities. Research in Transportation Business and Management, 41(December), 1–37. https://doi.org/10.1016/j.rtbm.2020.100596

2. Chang, Y. C., & Chen, C. F. (2011). Identifying mobility service needs for disabled air passengers. Tourism Management, 32(5), 1214–1217. https://doi.org/10.1016/j.tourman.2010.11.001
3. Correia, A. R., Wirasinghe, S. C., & de Barros, A. G. (2008). Overall level of service measures for airport passenger terminals. Transportation Research Part A: Policy and Practice, 42(2), 330–346. https://doi.org/10.1016/j.tra.2007.10.009
4. Ghosh, P., Ojha, M. K., & Geetika. (2017). Determining passenger satisfaction out of platform-based amenities: A study of Kanpur Central Railway Station. Transport Policy, 60(September), 108–118. https://doi.org/10.1016/j.tranpol.2017.09.007
5. Hranický, M. P., Nedeliaková, E., & Kuka, A. (2021). Innovations in the process of transporting the disabled. Transportation Research Procedia, 55(2019), 450–457. https://doi.org/10.1016/j.trpro.2021.07.008
6. Hu, X., Wang, J., & Wang, L. (2013). Understanding the Travel Behavior of Elderly People in the Developing Country: A Case Study of Changchun, China. In Procedia - Social and Behavioral Sciences (Vol. 96, pp. 873–880). https://doi.org/10.1016/j.sbspro.2013.08.099
7. Ipingbemi, O. (2015). Mobility challenges and transport safety of people with disabilities in Ibadan, Nigeria. In African Journal for the Psychological Study of Social Issues (Vol. 18, Issue 3, pp. 15–28).
8. Mun, L. Y., Xin, W. K., & Rajendran, S. D. (2019). A study on the Barriers in Accessibility for the Disabled at Bus Terminal. E3S Web of Conferences, 136, 0–5. https://doi.org/10.1051/e3sconf/201913604084
9. Petz, J. (1993). Ambulant disabled persons using buses: experiments with entrances and seats. Applied Ergonomics, 24(5), 313–326.
10. Soltani, S. H. K., Sham, M., Awang, M., & Yaman, R. (2012). Accessibility for Disabled in Public Transportation Terminal. Procedia - Social and Behavioral Sciences, 35(December 2011), 89–96. https://doi.org/10.1016/j.sbspro.2012.02.066
11. UNISDR. (2014). Living with Disability and Disasters: UNISDR 2013 Survey on Living with Disabilities and Disasters - Key Findings (Vol. 1, Issue 1). http://www.unisdr.org/2014/iddr/documents/2013DisabilitySurveryReport_030714.pdf%0Ahttp://www.un.org/disabilities/documents/convention/convoptprot-e.pdf
12. Wojuaden, C. A., & Badiora, A. I. (2017). Users' satisfaction with public transport operations in Ibadan, Nigeria. In Journal of Social Sciences Research (Vol. 3, Issue 9, pp. 88–96).
13. Wu, Y. J., Liu, W. J., & Yuan, C. H. (2020). A mobile-based barrier-free service transportation platform for people with disabilities. Computers in Human Behavior, 107(October 2018), 105776. https://doi.org/10.1016/j.chb.2018.11.005
14. Yao, L. Y., Sun, L. S., Wang, W. H., & Xiong, H. (2012). Concept layout model of transportation terminals. In Discrete Dynamics in Nature and Society (Vol. 2012). https://doi.org/10.1155/2012/148216
15. Zainol, H., Mohd Isa, H., Md Sakip, S. R., & Azmi, A. (2018). Social Sustainable Accessibility for People with Disabilities at Public Transport Stations through Sustainable Development Goals in Malaysia. Environment-Behaviour Proceedings Journal, 3(9), 89. https://doi.org/10.21834/e-bpj.v3i9.1499