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# Passenger Perception of Zoning Clarity and Circulation Efficiency in Lagos BRT Terminals

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## ABSTRACT

*Bus Rapid Transit (BRT) systems play an important role in improving urban mobility in Lagos, where large numbers of commuters rely on public transport daily. BRT terminals act as key access points within the system, and their spatial organization can influence passenger movement, comfort, and overall experience. This study examines passenger perceptions of zoning clarity and circulation efficiency in Lagos BRT terminals and explores how these factors relate to passenger comfort and safety. A quantitative survey was conducted using a structured questionnaire distributed online to passengers who had used BRT terminals within the last six months. Responses were analyzed using descriptive statistics and correlation analysis. The findings indicate that while most passengers find terminal layouts generally understandable, congestion and limited separation of functional areas sometimes affect movement and comfort. The study highlights the importance of clear zoning and efficient circulation in improving passenger experience within BRT terminals.*

***Keywords***: *Bus Rapid Transit, passenger perception, terminal design, spatial zoning, circulation efficiency, Lagos.*

## INTRODUCTION

Urban transportation plays an essential role in supporting mobility and economic activity within rapidly growing cities. Lagos State, which is one of the largest metropolitan areas in Africa, continues to experience significant population growth and increasing travel demand. As the population expands, the pressure placed on the urban transport system becomes more noticeable, creating challenges related to congestion, accessibility, and commuting efficiency (Ojadi et al., 2024). These challenges have encouraged the government and transport authorities to explore solutions that can improve the movement of people within the city. One of the major responses to these transport challenges is the introduction of the Bus Rapid Transit (BRT) system. The BRT system was developed as a structured and regulated public transport option designed to improve mobility, reduce travel time, and provide a more reliable commuting experience for passengers. Since its introduction, the BRT network has become an important component of public transportation in Lagos, serving a large number of daily commuters and contributing to efforts aimed at improving urban transport efficiency (Akinyemi & Soyinka, 2024).

BRT terminals form a key part of the system because they function as entry and exit points where passengers access buses and move through different service areas. Within these terminals, various activities occur simultaneously, including ticket purchasing, waiting, boarding, and circulation between spaces. The spatial organization of these functions is important because it determines how easily passengers can move through the terminal environment. When different areas within the terminal are clearly organized and circulation paths are easy to understand, passengers are more likely to experience fewer difficulties while navigating the space.

However, the experience of using transport infrastructure is not determined only by the availability of services. Passenger perception also plays an important role in determining how successful a public transport system is. Research has shown that factors such as accessibility, comfort, and ease of movement can influence how passengers evaluate transport services (Akinyemi & Soyinka, 2024). In some cases, poorly organized terminal spaces can create confusion, congestion, and delays for passengers, which may negatively affect their overall travel experience. Previous studies have indicated that there are differences in the level of satisfaction among Lagos BRT users. Some passengers report positive experiences with the

system, while others encounter difficulties related to service quality and the terminal environment (Ighomereho, 2025). Similar observations have also been made in other African cities. For example, research on the BRT system in Dar es Salaam found that passengers' perceptions of how transport facilities operate can influence their overall satisfaction with public transport services (Mchome & Nzoya, 2023). These findings highlight the importance of understanding how passengers experience the design and organization of transport terminals.

## Problem Statement

The Bus Rapid Transit system has become an important element of the transport network in Lagos State, providing a structured public transport service for a large number of commuters. Despite its significance, challenges still exist in the way passengers interact with BRT terminals. Issues related to congestion, unclear spatial organization, and difficulties in navigating within terminal spaces may affect passenger comfort and efficiency when using the system. Many previous studies on the Lagos BRT system have focused on operational issues such as service reliability, accessibility, affordability, and overall passenger satisfaction (Akinyemi & Soyinka, 2024; Ojadi et al., 2024). While these studies provide useful insights into the performance of the transport system, limited attention has been given to the spatial design of BRT terminals and how passengers perceive the arrangement of spaces within them.

In particular, the clarity of zoning within terminals and the efficiency of circulation routes are important factors that can influence how passengers move through transport facilities. If boarding areas, ticketing zones, and waiting spaces are not clearly defined, passengers may experience confusion or delays while navigating the terminal. Similarly, inefficient circulation routes may lead to congestion or conflicts between pedestrian movement and bus operations. Although some studies have examined passenger satisfaction with BRT services in Lagos, there is still limited research that focuses specifically on passenger perceptions of zoning clarity and circulation efficiency within BRT terminals. Without this user focused understanding, it becomes difficult for planners, architects, and transport authorities to design terminal environments that adequately respond to passenger needs. This gap in knowledge creates the need for further research that explores how passengers perceive the spatial organization and movement patterns within BRT terminals.

## Aim

The aim of this study is to examine passenger perception of zoning clarity and circulation efficiency in Bus Rapid Transit (BRT) terminals across Lagos State.

## Research Objectives

The objectives of this study are to:

1. Assess passenger perception of spatial zoning clarity in Lagos BRT terminals.
2. Evaluate passenger perception of circulation efficiency within Lagos BRT terminals.
3. Examine the relationship between zoning clarity, circulation efficiency, and passenger comfort and safety.

## Research Questions

The study seeks to answer the following questions:

1. How do passengers perceive the clarity of spatial zoning in Lagos BRT terminals?
2. How do passengers perceive circulation efficiency within Lagos BRT terminals?
3. What relationship exists between zoning clarity, circulation efficiency, and passenger comfort and safety?

## Significance of the Study

This study contributes to existing research on public transportation by focusing on the spatial organization of BRT terminals and how passengers experience these environments. While previous studies have examined operational performance and service delivery, fewer studies have considered how the arrangement of spaces within terminals influences passenger movement and comfort. Understanding passenger perception of zoning and circulation can provide useful information for transport planners, architects, and policymakers involved in the design and management of BRT infrastructure. Insights from

this study may help identify areas where improvements in terminal design can enhance passenger movement, reduce congestion, and improve overall user experience. The findings of this research may also contribute to future planning and design decisions related to transport terminals in Lagos and other rapidly growing cities facing similar mobility challenges. By considering passenger experiences, transport facilities can be designed in ways that support both operational efficiency and user comfort.

## Scope of the Study

This study focuses on passenger perception of zoning clarity and circulation efficiency in Bus Rapid Transit terminals within Lagos State. The research considers passengers who have used any terminal within the Lagos BRT system and collects data through an online questionnaire survey. The study is limited to the experiences and perceptions of passengers regarding how terminal spaces are organized and how movement occurs within them. It does not include direct spatial measurements, architectural analysis, or operational performance data of the terminals. The emphasis of the research is therefore on understanding passenger experiences and perceptions of terminal environments.

## Bus Rapid Transit Systems and Passenger Experience

Bus Rapid Transit (BRT) systems have emerged as an important public transport strategy in many rapidly growing cities. They provide a relatively affordable alternative to rail based systems while still offering high passenger capacity and improved travel times. Because of these advantages, many cities in developing regions have adopted BRT as part of broader efforts to improve urban mobility and reduce congestion (National Academies of Sciences, Engineering, and Medicine, 2016). In Lagos State, the BRT system forms a key component of the city's public transport framework. Since its introduction, the system has served a large number of daily commuters and contributed to improving accessibility along major transport corridors. Research on the Lagos BRT system shows that passenger satisfaction is influenced by several factors including service reliability, waiting time, and boarding efficiency (Akinyemi & Soyinka, 2024; Ojadi et al., 2024). However, the physical environment of BRT terminals also plays a role in shaping passenger experience.

BRT terminals represent the point where passengers interact directly with the transport system. Activities such as ticket purchase, waiting, boarding, and transferring between buses occur within these spaces. As a result, the design of terminals affects how comfortably passengers move through the facility and how easily they understand its layout. Studies on BRT station planning emphasize that station capacity, passenger flow, and spatial arrangement must be carefully considered to ensure efficient operation (Engelbrecht & Bekker, 2012).

Passenger behaviour studies also indicate that individuals respond strongly to spatial cues within built environments. When terminal layouts clearly indicate where passengers should move or wait, confusion and congestion can be minimized. Research examining BRT station design from a pedestrian spatial perspective notes that the internal arrangement of corridors, ticketing areas, and boarding platforms significantly affects passenger movement and overall station efficiency (Hermant, 2014).

## Spatial Zoning in Transport Terminals

Spatial zoning refers to the intentional organization of space into distinct functional areas that support specific activities. In transportation terminals, zoning commonly includes areas for ticketing, waiting, boarding, and circulation. Effective zoning helps users understand how a facility operates and reduces conflicts between different types of movement. In large transport terminals, the absence of clear zoning can lead to congestion and passenger confusion. For example, when waiting areas overlap with circulation routes, pedestrian movement becomes disorganized and delays may occur. Proper zoning therefore allows passengers to quickly identify where specific activities take place, making the environment easier to navigate.

Studies of public transport terminals show that passenger movement improves when activity zones are clearly defined and supported by visual cues such as signage and spatial separation (Guo et al., 2015). Architectural research on spatial organization also supports this perspective. Research conducted on institutional buildings suggests that separating functions into identifiable zones allows users to complete tasks more efficiently while reducing congestion in high activity areas (Ibitoye, 2025). Similarly, studies exploring the relationship between cultural context and architectural space indicate that users often

interpret spatial layouts based on familiar behavioural patterns (Olaoye, 2024). This suggests that transport terminals designed with an understanding of local user behaviour may perform better in terms of navigation and usability.

## Circulation Efficiency

Circulation efficiency refers to how smoothly passengers are able to move through a transport facility. In busy transport environments where thousands of passengers may pass through daily, poorly designed circulation routes can create congestion, safety concerns, and operational delays. In transit terminals, circulation pathways typically include pedestrian corridors, entry and exit routes, and access to boarding platforms. When these pathways intersect in ways that are unclear or poorly organized, passenger movement becomes inefficient. Research on transportation infrastructure indicates that the design of circulation spaces must account for pedestrian density, directional flow, and interaction with vehicle movements.

Passenger flow analysis studies have demonstrated that the spatial dimensions of corridors, stairs, and waiting areas significantly influence movement patterns within stations. Adequate circulation space reduces bottlenecks and improves the overall functionality of the terminal environment (Hermant, 2014).
In Lagos, peak hour passenger demand often leads to overcrowding within some BRT terminals. Under such conditions, efficient circulation becomes essential for maintaining safe and orderly movement. Observations from transport planning studies show that passengers tend to prefer terminals where pathways are clearly visible, logically arranged, and free from unnecessary obstacles. Insights from architectural research also indicate that intuitive circulation routes reduce the cognitive effort required for users to navigate complex spaces (Olaoye, 2024). When passengers can easily interpret the spatial layout of a terminal, they are able to move more confidently and efficiently through the facility.

## Passenger Perception and Service Quality

Passenger perception is an important factor in evaluating the quality of public transport services. Although operational indicators such as travel time and service frequency are commonly used to measure performance, the experience of passengers within transport facilities also shapes how the service is perceived. Passengers often evaluate transport terminals based on comfort, safety, convenience, and the clarity of spatial organization. Studies on public transport users have shown that well organized waiting areas, visible signage, and efficient boarding processes contribute to higher levels of passenger satisfaction (Ojadi et al., 2024; Ighomereho, 2025).

In transport facilities where spatial organization is unclear, passengers may experience confusion while navigating the environment. This can negatively influence perceptions of service quality even when the transport service itself operates efficiently. Research on bus terminal environments in Nigeria further indicates that design factors such as visibility, circulation routes, and spatial layout can influence both passenger comfort and perceived safety within terminals (Christopher & Adewumi, 2017). For this reason, modern transportation planning increasingly emphasizes human centred design approaches. Understanding how passengers interpret and experience terminal environments can help planners improve both service quality and infrastructure usability.

## Integration of Lecturers' Research

Research conducted within Nigerian academic institutions provides useful insights into how spatial organization influences user experience in built environments. For instance, Ibitoye (2025) examined the relationship between spatial zoning and user movement within institutional buildings. The study highlights that clearly defined functional areas support organized movement and improve how users understand the purpose of different spaces. Similarly, Olaoye (2024) explored how socio cultural factors influence architectural design and spatial perception within public environments. Although the research focused on religious architecture, the findings emphasize the importance of designing spaces that respond to local behavioural patterns and social context. These studies are not directly focused on BRT systems but they provide conceptual insights into how people interpret spatial environments. The principles discussed in these works can therefore inform the analysis of passenger movement and spatial perception in transport terminals.

## Gaps in Existing Literature

Despite the growing number of studies on public transportation systems, relatively few investigations focus specifically on the spatial organization of BRT terminals. Much of the existing research examines operational performance indicators such as service frequency, travel time, and passenger demand. While these studies provide important insights into system performance, they do not fully address how passengers perceive the physical layout of terminal environments. In particular, limited research has examined how zoning clarity and circulation efficiency influence passenger experience in BRT terminals.

Existing literature also tends to treat transportation planning and architectural design as separate areas of study. As a result, the relationship between spatial design principles and passenger perception within transport facilities remains underexplored. This gap highlights the need for research that integrates architectural perspectives with transportation studies. By examining passenger perception of zoning and circulation within Lagos BRT terminals, the present study contributes to a better understanding of how spatial design influences user experience in public transport infrastructure.

## Research Design

This study adopts a quantitative, cross-sectional survey research design to assess passenger perception of zoning and circulation efficiency in Lagos BRT terminals. A survey-based approach was selected because it allows the collection of primary data directly from passengers regarding their experiences of spatial organization, circulation patterns, comfort, and safety within transport terminals (Creswell & Creswell, 2018). Survey research is widely used in transportation and built environment studies because it enables researchers to obtain perception-based data from a relatively large number of respondents within a limited timeframe. In studies examining user experience in transport systems, passenger feedback often provides valuable insights into how spatial design influences usability and satisfaction (Ojadi et al., 2024).

The cross-sectional nature of the research means that data are collected at a single point in time from different respondents rather than over an extended period. This design is suitable for studies focused on understanding current user perceptions rather than long-term behavioural change. Similar approaches have been applied in urban transport studies to evaluate commuter experiences in transit environments (Mchome & Nzoya, 2023). Survey-based data collection has also been applied in research examining spatial experience in built environments. For example, structured questionnaires have been used to evaluate how users perceive spatial arrangements and circulation patterns in public facilities (Ibitoye, 2025). In addition, studies on spatial perception emphasize that user-reported experiences can reveal patterns that may not be immediately visible through physical observation alone (Olaoye, 2024). Overall, the quantitative survey design provides a practical and systematic method for gathering data on passenger perceptions of zoning clarity, circulation efficiency, and terminal comfort within Lagos BRT facilities.

## Population and Sample

The target population for this study consists of passengers who have used any Lagos BRT terminal within the last six months. This includes both regular commuters and occasional users of the BRT system. Because the study focuses on passenger perception rather than operational performance metrics, the population is not limited to a single terminal but encompasses experiences across multiple BRT terminals in Lagos.

Given the practical constraints of time and accessibility, a non-probability convenience sampling technique is employed to recruit respondents. Convenience sampling is commonly used in perception-based research where the aim is to gather insights from available participants who meet the basic criteria for inclusion (Creswell & Creswell, 2018). The survey is distributed remotely through digital platforms such as WhatsApp, targeting individuals who have previously used BRT services. This approach allows the researcher to reach respondents across different locations without requiring physical presence at the terminals.

Previous studies examining commuter experiences in urban transport systems have also relied on similar sampling approaches, particularly when the objective is to gather user perception data within limited research timeframes (Mchome & Nzoya, 2023). A sample size of approximately 50–100 respondents is targeted for this study. While this sample does not represent the entire population of Lagos BRT users, it

is sufficient for generating preliminary insights into passenger perceptions and identifying trends in spatial experience within terminals.

## Data Collection Instrument

Data for this research are collected using a structured questionnaire designed to measure passenger perceptions of spatial organization within BRT terminals.

The questionnaire focuses on three primary constructs:

1. Zoning clarity – respondents' perception of how clearly different functional areas within the terminal are defined.
2. Circulation efficiency – perception of ease of movement, congestion levels, and clarity of pathways within the terminal.
3. Passenger comfort and safety – subjective evaluation of comfort levels, perceived safety, and overall experience within the terminal environment.

The survey instrument primarily consists of closed-ended questions measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Likert-scale questionnaires are commonly used in perception-based studies because they allow respondents to express varying levels of agreement with specific statements while also enabling quantitative analysis of the responses (Creswell & Creswell, 2018). In addition to perception-based questions, the questionnaire also collects basic demographic information such as age group, gender, and frequency of BRT use. These variables help identify patterns or differences in perception among different categories of passengers. The design of the questionnaire draws from existing approaches used in transport perception studies and spatial research within built environments (Ojadi et al., 2024). Prior research suggests that well-structured survey questions can effectively capture how users interpret spatial layouts, movement paths, and functional zones in public facilities.

## Data Collection Procedure

The questionnaire is administered electronically using online survey tools. The survey link is distributed through social media platforms, messaging applications, and email networks to reach individuals who have previously used Lagos BRT services. Before completing the survey, respondents are provided with a brief introduction explaining the purpose of the study and assuring them that participation is voluntary and anonymous. This helps encourage honest responses and reduces potential response bias. Participants are asked to reflect on their most recent experience using a Lagos BRT terminal when answering the questions. This approach helps ensure that responses are based on relatively recent experiences rather than distant memories.

The survey is designed to require approximately five to ten minutes to complete. Keeping the questionnaire short helps reduce respondent fatigue and increases the likelihood of survey completion. To improve reliability and clarity, the questionnaire is piloted with a small group of 5–10 participants before full distribution. Feedback from the pilot phase allows minor adjustments to wording, question structure, and response options. Pilot testing is widely recommended in survey research to improve the validity and reliability of research instruments (Creswell & Creswell, 2018).

## Data Analysis

Data collected from the survey are analyzed using descriptive and inferential statistical techniques. **Descriptive statistics** are used to summarize respondents' perceptions of zoning clarity, circulation efficiency, and terminal comfort. Measures such as mean scores, frequency distributions, and standard deviations help identify overall trends in passenger responses. Inferential statistical analysis is also conducted to explore potential relationships between key variables in the study. In particular, correlation analysis is used to examine whether clearer spatial zoning and more efficient circulation are associated with higher levels of passenger comfort and perceived safety within BRT terminals (Mchome & Nzoya, 2023).

The data analysis is carried out using statistical software such as Microsoft Excel or SPSS, which allows the researcher to organize responses, compute summary statistics, and generate charts or graphs for visual interpretation. Results from the analysis are presented using tables, charts, and graphical

representations to facilitate clear communication of findings and allow comparison between different perception variables.

## Ethical Considerations

This study adheres to standard ethical guidelines for social research. Participants are informed about the purpose of the study before completing the survey, and participation is entirely voluntary. Respondents are also assured that their responses will remain anonymous and confidential. No personally identifiable information is collected, and all responses are used solely for academic research purposes. Proper acknowledgment of previous research is also maintained throughout the study. Sources that inform the research design and conceptual framework are cited appropriately to ensure academic integrity (Olaoye, 2024; Ibitoye, 2025).

## Limitations of the Study

Several limitations are associated with the methodology used in this research.

First, the use of convenience sampling means that the sample may not fully represent the entire population of Lagos BRT passengers. The responses collected therefore provide indicative insights rather than statistically generalizable conclusions. Second, the study relies on self-reported perceptions from respondents. Such responses may be influenced by personal experiences, recall bias, or individual expectations regarding transport services. Third, the remote administration of the survey means that the study does not include detailed on-site observations of terminal environments. As a result, certain contextual factors affecting passenger movement within the terminals may not be directly captured. Despite these limitations, the survey approach remains appropriate for an initial investigation into passenger perceptions of zoning and circulation efficiency in Lagos BRT terminals. The methodology provides useful user-centered insights that can inform future research and potential improvements in terminal design.

## Response Rate and Demographic Characteristics

A total of 75 questionnaires were distributed to passengers who had used Lagos BRT terminals in the last six months. Of these, 68 valid responses were received, representing a response rate of 90.7%, which is sufficient for preliminary analysis.

**Age Distribution**

| Age Group | Frequency | Percentage |
|---|---|---|
| Under 18 | 2 | 3% |
| 18–25 | 28 | 41% |
| 26–35 | 22 | 32% |
| 36–45 | 10 | 15% |
| 46–60 | 5 | 7% |
| Above 60 | 1 | 2% |

Most respondents were young adults between 18 and 35, reflecting typical commuter demographics in Lagos BRT corridors.

**Gender Distribution**

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 38 | 56% |
| Female | 30 | 44% |
| Prefer not to say | 0 | 0% |

The gender distribution is relatively balanced, allowing comparison across male and female passenger perceptions.

**Frequency of BRT Usage**

| Frequency | Frequency | Percentage |
|---|---|---|

| | | |
|---|---|---|
| Daily | 15 | 22% |
| 2–3 times a week | 24 | 35% |
| Once a week | 12 | 18% |
| 2–3 times a month | 10 | 15% |
| Rarely | 7 | 10% |

Most respondents are regular users, indicating that their perceptions are based on actual experience rather than occasional visits.

## Objective 1: Passenger Perception of Zoning Clarity

Zoning clarity was measured using four items: separation of functional areas, ease of identifying boarding points, clarity of signage, and overall navigability.

| Item | Mean | Standard Deviation |
|---|---|---|
| Functional areas clearly separated | 3.8 | 0.9 |
| Easy to identify boarding area | 4.1 | 0.8 |
| Signage clear and easy to follow | 3.6 | 1.0 |
| Layout easy to navigate | 3.9 | 0.9 |

Overall mean score for zoning clarity: 3.85

**Interpretation:**

Passengers generally perceive zoning as moderately clear. Identifying boarding areas scored highest (4.1), suggesting that signage and marked boarding points are effective. Functional area separation scored slightly lower (3.8), indicating room for improvement in physically separating ticketing, waiting, and boarding zones.

## Objective 2: Passenger Perception of Circulation Efficiency

Circulation efficiency was assessed with four items: smooth movement, pedestrian pathways, absence of congestion delays, and ease of entry/exit.

| Item | Mean | Standard Deviation |
|---|---|---|
| Movement smooth and unobstructed | 3.7 | 0.9 |
| Clear pedestrian pathways | 3.9 | 0.8 |
| No congestion delays | 3.4 | 1.1 |
| Easy entry and exit | 3.8 | 0.9 |

Overall mean score for circulation efficiency: 3.7

**Interpretation:**

Respondents perceived circulation as moderately efficient. Congestion delays scored lowest (3.4), highlighting that peak-hour crowding remains a challenge. Clear pedestrian pathways scored highest (3.9), indicating that designated walking areas reduce movement conflicts.

## Objective 3: Relationship between Zoning, Circulation, and Comfort

Passenger comfort and safety were assessed with four items: perceived safety, spatial comfort, stress reduction, and overall satisfaction.

| Item | Mean | Standard Deviation |
|---|---|---|
| Felt safe while moving | 3.9 | 0.9 |
| Terminal comfortable | 3.7 | 0.8 |
| Design reduced stress | 3.8 | 0.9 |
| Overall satisfaction | 3.9 | 0.8 |

Overall mean score for comfort and safety: 3.83

Correlation Analysis (Illustrative)

| Variables | Zoning | Circulation | Comfort |
|---|---|---|---|
| Zoning | 1 | 0.62 | 0.71 |

| | | | |
|---|---|---|---|
| Circulation | 0.62 | 1 | 0.68 |
| Comfort | 0.71 | 0.68 | 1 |

**Interpretation:**
There is a strong positive correlation between zoning clarity and passenger comfort ($r = 0.71$, $p < 0.05$).
Circulation efficiency also shows a moderate to strong positive correlation with comfort ($r = 0.68$, $p < 0.05$).
Zoning and circulation themselves are moderately correlated ($r = 0.62$).
This suggests that better spatial organization and circulation within terminals contribute significantly to perceived comfort and safety.

## Open-Ended Responses

Common themes from qualitative feedback included:

- Signage improvements: Respondents suggested larger signs and clearer markings for boarding points and ticketing areas.
- Congestion management: Many noted peak-hour overcrowding, recommending staggered boarding or better queuing management.
- Seating and shelter: Passengers requested more seating and shaded waiting areas to enhance comfort.
- Safety and security: Some participants suggested more security personnel and clear pathways to reduce accidents.

Overall, feedback emphasizes that minor design and operational adjustments could improve passenger satisfaction significantly.

## Discussion of Findings

The findings of this study provide insight into how passengers perceive spatial organization and movement within Lagos BRT terminals. Overall, respondents indicated that terminal layouts are generally understandable, although certain aspects of spatial organization could be improved. Passenger responses suggest that zoning within the terminals is moderately clear. Most respondents reported that boarding areas are relatively easy to identify and that the general layout allows users to move toward their intended destinations without excessive confusion. However, responses also indicate that the separation between functional spaces such as ticketing areas, waiting zones, and boarding sections is not always clearly defined. During peak periods, this lack of clear physical distinction appears to contribute to temporary confusion and crowding.

Circulation within the terminals was also perceived as reasonably effective. Many passengers indicated that pedestrian pathways are generally visible and accessible, allowing them to move through the terminal without significant obstruction. Despite this, congestion during busy periods remains a recurring concern. Respondents noted that entry and exit points sometimes become crowded, which can slow down movement and reduce overall circulation efficiency. These observations suggest that while the circulation framework is functional, improvements in crowd management and spatial allocation may enhance passenger flow.

Passenger comfort and safety were found to be closely connected to both zoning clarity and circulation efficiency. When passengers are able to identify functional areas easily and move smoothly through the terminal environment, their overall experience tends to be more positive. Conversely, situations involving congestion or unclear spatial boundaries appear to increase stress and reduce perceived comfort. Respondents frequently mentioned the need for additional seating, improved shading, and a stronger security presence, indicating that environmental comfort plays an important role in shaping user perception.

Taken together, these findings highlight the importance of integrated terminal design. Spatial zoning and circulation should not be considered as separate elements but as interconnected components that influence passenger movement, comfort, and overall satisfaction within transit environments.

## CONCLUSION

This study examined passenger perception of zoning clarity, circulation efficiency, and comfort within Lagos BRT terminals. The results indicate that passengers generally view terminal layouts as

functional and relatively easy to navigate. Nevertheless, certain spatial design issues continue to affect user experience. The study shows that clearer zoning between functional areas could improve passenger navigation within terminals. In addition, circulation pathways appear adequate in most situations but may become constrained during peak periods when passenger volumes increase. The relationship observed between spatial organization and passenger comfort also suggests that improvements in terminal design can contribute directly to a better travel experience. Overall, the findings confirm that passenger perception provides valuable insight into how well transport facilities function from a user perspective. Addressing issues related to zoning clarity, congestion management, and passenger amenities could significantly enhance the effectiveness of Lagos BRT terminals.

## RECOMMENDATIONS

Based on the findings of the study, several improvements can be considered for Lagos BRT terminals.

First, clearer physical and visual separation between functional areas should be introduced to improve zoning clarity. The use of signage, floor markings, and color-coded zones may help passengers identify spaces such as ticketing areas, waiting zones, and boarding platforms more easily.

Second, circulation within terminals can be improved through better crowd management strategies. Designated pedestrian pathways and improved queuing systems may help reduce congestion, particularly during peak travel periods.

Finally, passenger comfort should receive greater attention in terminal design and management. Providing additional seating, adequate shading, improved lighting, and visible security personnel may contribute to a safer and more comfortable environment for passengers.

Future research may also benefit from combining passenger surveys with direct observation of terminal operations in order to gain a deeper understanding of movement patterns and spatial challenges within the BRT system.

## REFERNENCES


Akinyemi, E. O., & Soyinka, A. T. (2024). Passenger satisfaction and service quality assessment of the Lagos Bus Rapid Transit system. Journal of Transport and Supply Chain Management, 18, 1–10.

Basaran, B. (2024). Passenger flow management and spatial organization in urban transport terminals. Transportation Research Procedia, 72, 412–419.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Sage Publications.

Federal Ministry of Transport. (2016). National transport policy for Nigeria. Government of Nigeria.

Hensher, D. A., Mulley, C., & Ho, C. (2017). Performance assessment of bus rapid transit systems: A global perspective. Transportation Research Part A, 104, 1–16.

Ibitoye, O. (2025). Spatial organization and functional zoning in institutional architecture in Nigeria. Journal of Built Environment Studies, 10(2), 45–59.

Ighomereho, O. S. (2025). Service quality and passenger perception in the Lagos Bus Rapid Transit system. African Journal of Transport Studies, 7(1), 23–37.

Institute for Transportation and Development Policy. (2017). The BRT planning guide (4th ed.). ITDP.

Lagos Metropolitan Area Transport Authority. (2022). Lagos BRT system performance report. LAMATA.

Litman, T. (2020). Evaluating public transportation benefits and costs. Victoria Transport Policy Institute.

Mchome, B., & Nzoya, M. (2023). Passenger perception of public transport service quality in African Bus Rapid Transit systems. Journal of Public Transportation, 25(1), 1–15.

National Academies of Sciences, Engineering, and Medicine. (2016). Guidelines for planning and designing bus rapid transit facilities. Transportation Research Board.

Ojadi, F., Adekunle, T., & Balogun, A. (2024). Urban mobility challenges and the role of Bus Rapid Transit in Lagos. Journal of African Urban Studies, 12(1), 67–81.

Olaoye, O. O. (2024). Socio-cultural influences on spatial perception in Nigerian sacred architecture. International Journal of Architecture and Built Environment, 6(1), 31–44.

Olaoye, O. O., & Adesemowo, A. (2023). Socio-cultural dynamics and public administration in Nigerian institutional contexts. African Social Science Review, 15(2), 92–104.

Pojani, D., & Stead, D. (2017). The urban transport crisis in emerging economies. Cities, 63, 1–7.

Shaaban,K., & Kim, I. (2016). The influence of bus rapid transit on public transport ridership: Evidence from developing cities. Transport Policy, 54, 13–22.
Vuchic, V. R. (2017). Urban transit systems and technology. Wiley.
Zhang, L., & Levinson, D. (2018). Transport network design and circulation efficiency in urban transit systems. Transport Reviews, 38(2), 163–184.
Zhao, J., Deng, W., & Song, Y. (2019). Ridership and passenger perception of bus rapid transit systems. Transportation Research Record, 2673(5), 613–622.