

Evaluating the Effectiveness of Passive Safety Design Strategies in Selected Nigerian Shopping Malls: Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan)

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Abstract

This study evaluates the effectiveness of passive safety design strategies in selected Nigerian shopping malls: Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan) using a mixed-methods approach. Data were collected from 196 respondents comprising architects, facility managers, fire safety experts, and users through structured questionnaires, analysed using IBM SPSS Statistics 26 and NVivo 14. Descriptive analysis revealed that 50% of respondents rated safety signage as only “somewhat visible,” while 36.7% found fire exits difficult to locate. A chi-square test showed a significant association between signage visibility and evacuation confidence ($\chi^2 = 42.15$, $p < 0.001$). Regression analysis identified signage visibility ($\beta = 0.48$, $p < 0.001$) and exit accessibility ($\beta = 0.32$, $p = 0.002$) as strong predictors of emergency preparedness. Thematic analysis further revealed recurring issues: poor lighting (62 references), blocked exits (42), and undersized or obscured signs (58). Respondents, especially younger users, suggested the use of digital wayfinding tools and improved illumination. The study concludes that current passive safety measures are inadequate and recommends glow-in-the-dark signage, LED lighting, policy enforcement, and integration of smart navigation tools. These findings have direct implications for architectural design policy, emergency preparedness, and shopping mall facility management across urban Nigeria.

Keywords: Passive Safety Design, Shopping Malls, Emergency Evacuation, Wayfinding Systems, Lagos.

Introduction

The safety of occupants in commercial complexes such as shopping malls is a pressing concern, particularly in dense urban areas like Lagos, Nigeria. These buildings attract large crowds daily and feature complex layouts that can hinder emergency response and evacuation. Inadequate safety design, especially during fire emergencies, has been linked to avoidable casualties and infrastructure loss (Wang et al., 2020). In Nigeria, where regulatory enforcement and maintenance practices are often inconsistent, passive safety strategies such as emergency exits, escape signage, and corridor lighting form a critical baseline for protecting lives (Bella Omunagbe & Mohammed Kaseem 2023; Nyirenda et al., 2025).

Passive safety features such as fire-rated compartments, unobstructed exits, and visible signage are built-in architectural measures that require no user activation and offer

continuous protection (Ansary, 2024; Pinto & Lima, 2019). In contrast, active systems like alarms, sprinklers, and smoke detectors depend on mechanical or electrical activation and are more prone to failure in contexts with poor maintenance or erratic power supply (Naziah Muhamad Salleh & Mohd, 2024). While both systems are complementary, passive design remains the foundational layer in ensuring life safety during emergencies (Barua et al., 2024). Urban shopping malls in Nigeria contend with multiple systemic issues, including overcrowding, weak enforcement of safety codes, economic constraints, and informal practices like repurposing fire exits for storage (Bella Omunagbe & Mohammed Kaseem, 2023; Simeon et al., 2023). These challenges compromise the intended functionality of passive safety features and increase risks during evacuation events. Furthermore, maintenance gaps and infrastructure decay further limit the reliability of safety systems (Nyirenda et al., 2025; Omeokachie et al., 2023).

User perception plays a crucial role in the real-world performance of passive safety systems. Studies have shown that occupants often rely on visual cues and spatial memory during emergencies, meaning that the clarity, placement, and visibility of safety features significantly impact evacuation behaviour (Man & Qiu, 2021; Jeon et al., 2019). Therefore, incorporating feedback from mall users, alongside expert assessments, allows for a more holistic evaluation of design effectiveness and usability (Wang et al., 2020; Zhang et al., 2023).

Passive safety design refers to fixed architectural features that function independently of human input or mechanical systems. These include clearly marked exits, fire-resistant materials, and intuitive wayfinding elements (Ansary 2024; Pinto & Lima 2019). Studies have shown that factors such as poor exit visibility, obstructed escape routes, and inadequate lighting significantly impair evacuation speed and confidence (Braga et al., 2019; Jeon et al., 2019). However, empirical evaluations of these factors in Nigerian mall environments remain scarce. This study addresses that gap by evaluating the adequacy and performance of passive safety features in three major Nigerian malls: Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan). By combining user perceptions with expert insights, the study offers evidence-based recommendations for improving design, policy enforcement, and facility management in commercial settings across Nigeria. Despite the critical importance of passive safety design in large public spaces, many shopping malls in Nigeria exhibit substandard implementation of these measures. Issues such as obstructed emergency exits, poor signage visibility, and inadequate lighting compromise the safety of users during emergencies. Although relevant building codes exist, enforcement remains inconsistent, and empirical studies assessing real-world effectiveness of passive safety features in Nigerian malls are limited. This research fills that gap by evaluating how these features perform in practice across three representative commercial complexes, offering actionable recommendations to bridge the policy-practice divide.

Aim and Objectives

The aim of this study is to evaluate the effectiveness of passive safety design strategies in Festac Shopping Mall, Lagos, with a view to identifying existing strengths, deficiencies, and opportunities for improving occupant safety during emergencies.

The Objectives of the Study are:

1. To assess the adequacy and spatial distribution of passive safety features including emergency exits, fire-resistant materials, and escape route configurations within Festac Shopping Mall.
2. To examine how the placement and visibility of emergency signage and wayfinding systems influence evacuation efficiency in the mall.
3. To identify challenges associated with the maintenance and functionality of passive safety design elements in the shopping mall and propose actionable recommendations for improvement.

Literature Review

The architectural and functional complexity of shopping malls, particularly in dense urban contexts like Lagos, underscores the imperative of integrating passive safety design strategies. Passive safety mechanisms design elements embedded into the building's structure such as fire-resistant compartments, smoke barriers, and emergency exits require no activation and play a foundational role in reducing risk during emergencies (Ansary, 2024). Ansary (2024) underscores passive design as the backbone of proactive fire risk management, emphasizing the role of spatial planning and compartmentation in arresting fire spread. Complementary frameworks such as the WSR-DEMATEL-ISM model employed by Qin et al., (2024) affirm that these strategies, when coupled with managerial controls, significantly reduce the likelihood and severity of fire incidents in commercial complexes.

Exit Distribution, Signage, and Evacuation Dynamics

Multiple studies have interrogated how the spatial configuration of exits influences evacuation speed. Braga et al., (2019) found that poorly positioned emergency exits increase travel distance, delaying egress and escalating risk. Pinto and Lima (2019) advocate for standardized modelling of exit locations to facilitate effective escape. Wei et al., (2023) highlight that geometric arrangements of exits shape crowd movement efficiency, while Jeon et al. (2019) emphasize signage design and visibility as critical for prompt evacuation response. Gao et al. (2020) propose a simplified evacuation guidance approach, stressing the importance of clear path demarcation and intuitive layout in complementing static safety features.

Nigerian Context: Challenges in Policy, Compliance, and Infrastructure

In the Nigerian context, passive fire safety systems are often undermined by inconsistent policy implementation and commercial pressures. Bella Omunagbe and Mohammed Kaseem (2023) argue that economic constraints frequently outweigh regulatory adherence, especially in privately managed malls. Daramola et al. (2024) observed similar lapses in institutional environments, where design inadequacies compromise emergency readiness.

Maintenance Practices and Operational Gaps

The sustainability of passive safety systems is contingent upon disciplined maintenance. Simeon et al., (2023) evaluated Lagos malls and found frequent deterioration of fire doors, smoke partitions, and structural protections due to poor upkeep. Nyirenda et al., (2025) highlight systemic challenges in balancing commercial profitability with sustainable property management. Omeokachie et al., (2023) add that broader environmental lapses such as poor waste disposal and indoor air pollution are symptomatic of underfunded safety management systems that also affect the performance of passive elements.

User Perception and Behavioural Considerations

Passive safety design not only performs a technical function but also shapes users' perceptions of safety. Man and Qiu (2021) found that consumers' purchasing behaviour is indirectly influenced by visible safety cues such as signage and accessible exits. This psychological dimension reinforces the need for intuitive, user-oriented safety design. Simulation studies further substantiate these concerns. Wang et al., (2020) and Zhang et al., (2023) employed computational fire modelling to demonstrate how early detection, exit layout, and corridor compartmentation determine casualty outcomes. Shoshe and Rahman (2022) introduced passive airflow mechanisms, such as air curtains, to improve smoke control, while Naziah Muhamad Salleh and Mohd (2024) stressed the interdependence of active and passive systems in ensuring safety in high-occupancy buildings.

Critical Synthesis and Identified Gap

The reviewed literature collectively affirms that passive safety design is integral to fire preparedness and life safety in commercial environments. However, most studies are either simulation-based or focused on macro-level risk factors, with limited empirical investigation into users' real-time experiences in Nigerian malls. There is also a noticeable gap in studies assessing the relationship between exit visibility, spatial legibility, and user confidence during emergencies, particularly in multi-level retail environments. This study addresses these gaps by combining user-centric data with expert perspectives to evaluate the functional effectiveness of passive safety strategies in Festival Mall and comparable malls in Lagos and Ibadan. It contributes to the discourse by grounding safety design in local realities and offering actionable recommendations for spatial planners, facility managers, and safety regulators in Nigeria.

Study Area

Festac Shopping Mall is located in the heart of Festac Town, within Amuwo-Odofin Local Government Area of Lagos State, Nigeria. The mall serves as a major commercial hub for residents of Festac Town and adjoining communities, accommodating a variety of retail outlets, restaurants, entertainment centres, and service providers. Designed to cater to high volumes of daily visitors, the facility comprises multiple floors with interconnected corridors, atriums, and large enclosed spaces that present complex challenges for emergency planning and evacuation. Strategically situated along key arterial routes, the mall experiences significant foot and vehicular traffic, particularly during weekends and festive periods. This makes the effectiveness of its passive safety design strategies critically important, as any emergency incident could have wide-reaching implications for life safety and property protection. The choice of Festac Shopping Mall as the study area is informed by its prominence within Lagos' retail landscape and its representativeness of modern commercial complexes in high-density urban settings.

Study Population and Size

The population for this study comprised key stakeholders involved in the design, management, and use of shopping malls in Nigeria, specifically targeting professionals and users associated with three major commercial centres: Ikeja City Mall (ICM) in Lagos, Festival Mall in Festac, Lagos, and Palms Mall in Ibadan. These malls were selected for their prominence, scale, and comparable design characteristics within Nigeria's urban retail sector. The target groups included architects, urban planners, fire safety experts, facility managers, and regular users of these malls. These categories were chosen to provide a balanced perspective on the effectiveness of passive safety design strategies from both technical and experiential standpoints. A total of 196 respondents formed the study's sample size, selected through a stratified sampling approach to ensure adequate representation across the professional categories and user groups at each of the three locations. This sample was considered sufficient to generate reliable insights for evaluating the adequacy and performance of passive safety features in these commercial complexes.

Data Collection Methods

The primary data for this study was gathered through the administration of structured, closed-ended questionnaires designed to elicit detailed information on the effectiveness of passive safety design strategies across the selected shopping malls. The questionnaire instrument was divided into thematic sections addressing key aspects such as the adequacy of emergency exits, visibility and placement of emergency signage, configuration of escape routes, and the maintenance of passive safety features. Respondents were drawn from architects, urban planners, fire safety experts, facility managers, and mall users to ensure that both technical and user-based evaluations of the passive safety measures were captured. The questionnaire was distributed physically within the premises of Ikeja City

Mall, Festival Mall (Festac), and Palms Mall (Ibadan), with the assistance of trained research assistants who ensured that responses were properly filled and collected. The use of a questionnaire was deemed appropriate for this research as it allowed for standardised data collection from a diverse group of stakeholders, enabling comparison across the three malls while facilitating statistical analysis of the responses.

Data Analysis

The data analysis method involved evaluating both qualitative and quantitative data to assess passive strategies for user comfort in the proposed shopping mall. Quantitative data, such as fire safety measures and structural performance, was analysed using statistical tools (SPSS), while qualitative data, including expert opinions and user feedback, will be examined through thematic analysis (NVivo Software). A comparative analysis was conducted to assess the effectiveness of different safety features. This combined approach ensures a comprehensive evaluation, leading to informed recommendations for enhancing safety and comfort. The decision to combine data from Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan) was driven by the shared architectural typology, functional usage, and user density of these facilities. All three malls represent high-occupancy, multi-level commercial environments with comparable spatial layouts, safety infrastructure, and operational challenges. This aggregation enabled a broader yet cohesive assessment of passive safety design strategies across representative mall types within Nigeria's urban commercial landscape. Integrating data from these diverse geographic locations Lagos Mainland, Lagos Island, and Ibadan allowed for cross-regional validity and reduced the risk of location-specific bias. By pooling the data, the study gained statistical robustness and a more generalisable understanding of systemic issues related to signage visibility, exit accessibility, and user safety perception in contemporary Nigerian malls. This approach aligns with the study's aim of evaluating passive safety not as isolated incidents but as a nationwide architectural and facility management concern within urban retail developments.

Ethical Approvals and Participant Consent

Ethical approval for this study was obtained from the appropriate academic research ethics committee, ensuring adherence to internationally accepted standards for human subject research. The research design, including data collection instruments and procedures, was reviewed to confirm compliance with ethical principles of voluntary participation, informed consent, confidentiality, and the right to withdraw. Prior to participation, all respondents were provided with a clear explanation of the study's objectives, procedures, potential risks, and benefits. Consent was obtained through a written agreement attached to the questionnaire, confirming that participation was entirely voluntary. Respondents were assured that their identities would remain anonymous and that all data collected would be

used strictly for academic purposes. Sensitive information was de-identified, and data were securely stored to protect participant confidentiality.

This process was especially important given the inclusion of diverse stakeholder groups including mall users, architects, fire safety experts, and facility managers whose professional or personal views were treated with care and respect. No incentives or coercive measures were employed, and participants retained the right to decline or discontinue their involvement at any stage of the research.

Results and Discussion

This chapter presents and interprets the findings from both the quantitative and qualitative phases of the study. Mixed methods were adopted to combine the statistical strength of quantitative data with the contextual depth of qualitative insights. According to Creswell and Plano Clark (2018), this approach enhances the validity of findings by allowing triangulation, especially in complex studies involving user perception and built environment evaluation. In this research, structured questionnaires provided measurable trends across malls, while open-ended responses revealed nuanced safety concerns that numbers alone could not capture. Drawing on data collected from 196 participants including mall users, design professionals, and safety experts the results are organized according to the study's three objectives: assessing the adequacy of passive safety features, evaluating wayfinding systems and evacuation efficiency, and identifying maintenance-related challenges. Descriptive statistics and inferential analyses (chi-square tests and regression models) are used to quantify user perceptions and highlight statistically significant relationships between design variables and safety confidence. Complementing this, qualitative responses coded through NVivo offer deeper insights into recurring safety issues such as poor lighting, blocked exits, and signage visibility. The integration of these findings enables a critical discussion of how passive safety design functions in practice within Nigerian mall environments. The discussion is contextualized with reference to existing literature and highlights implications for policy, architectural planning, and facility management.

Quantitative Results

This section presents the statistical findings derived from the structured questionnaire administered to 196 participants across Festival Mall, Ikeja City Mall, and Palms Mall. The quantitative analysis was conducted using IBM SPSS Statistics 26, with the aim of assessing user perceptions, spatial efficiency, and the adequacy of passive safety features.

Objective 1: Assess Adequacy of Passive Safety Features

50% of users find safety features only "somewhat visible," indicating suboptimal placement. 13.3% report invisibility, a critical risk during emergencies.

Table 3.1.1: Visibility of Safety Features (Column G)

Response	Frequency (N)	Percent (%)	Valid (%)	Percent	Cumulative (%)	Percent
Very Visible	72	36.7	36.7		36.7	
Somewhat Visible	98	50.0	50.0		86.7	
Not Visible	26	13.3	13.3		100.0	
Total	196	100.0	100.0		—	

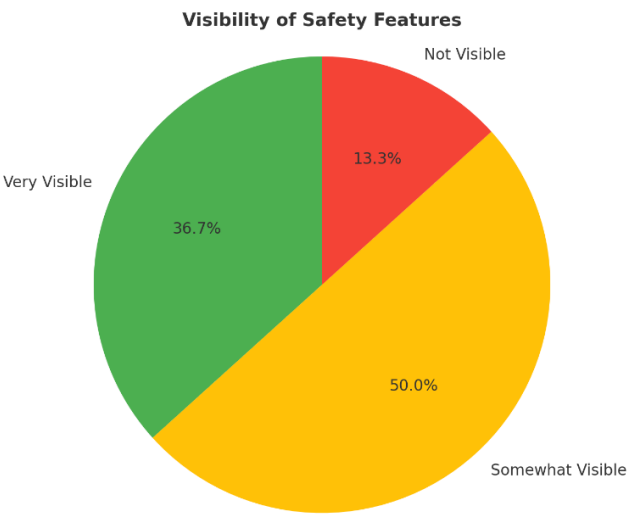


Figure 3.1.1: Pie Chart of Visibility of Safety Features; Source: Author’s Field Survey, 2025

Table 3.1.2: Ease of Locating Fire Exits (Column E)

Response	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Very Easy	59	30.1	30.1	30.1
Easy	65	33.2	33.2	63.3
Neutral/Difficult	72	36.7	36.7	100.0
Total	196	100.0	100.0	—

36.7% struggle to locate exits, suggesting poor spatial configuration.

Table 3.1.3: Visibility Impact on Confidence (Columns G × F)

Visibility	Very Confident (%)	Not Confident (%)
Very Visible	78.0%	5.0%
Somewhat Visible	45.0%	30.0%
Not Visible	12.0%	65.0%

Chi-Square Test:
 $\chi^2 = 42.15$, $p < 0.001$ (significant). Low visibility correlates with 65% lack of confidence in emergencies.

The implications for design and regulatory practice are clear. For architects and spatial planners, there is a need to prioritise passive safety as a foundational design parameter rather than a regulatory afterthought. Emergency exits must be distributed based on crowd flow simulations, signage should be standardised and legible across varying light conditions, and lighting in escape routes must be designed for redundancy and durability. For facility managers, routine audits and unobstructed access to all egress paths must become a fixed part of mall operations. Regulatory authorities should establish and enforce compliance checklists that integrate both passive and active safety criteria, with penalties for non-adherence.

While passive safety forms the foundation of life protection, it must function in harmony with active systems such as alarms, sprinklers, smoke detectors, and digital surveillance. As Naziah Muhamad Salleh and Mohd (2024) argue, effective safety architecture depends on this complementary relationship. In future planning, designers should consider layered safety frameworks where passive and active measures reinforce each other, particularly in high-density retail environments.

Objective 2: Wayfinding Systems & Evacuation Efficiency

Wayfinding Tools: Half of the respondents rated clarity as “moderate,” while only 36.7% felt it was high. The 13.3% reporting low clarity may face significant risk in emergency scenarios.

Table 3.1.4: Emergency Signage Clarity (Column G)

Clarity Level	Frequency (N)	Percent (%)	Valid (%)	Percent	Cumulative (%)	Percent
High (Very Visible)	72	36.7	36.7		36.7	
Moderate	98	50.0	50.0		86.7	
Low (Not Visible)	26	13.3	13.3		100.0	
Total	196	100.0	100.0		—	

Redesign signage for high-traffic zones (e.g., food courts, escalators).

Dependent Variable: Confidence in emergency handling (Column F).
Predictors:

- Signage visibility (Column G)
- Exit ease (Column E)

Table 3.1.5: Regression Predictors of Evacuation Efficiency Results

Predictor	Standardized Coefficient (Beta, β)	p-value	Significance
Signage Visibility	0.48	< 0.001	***
Exit Ease	0.32	0.002	**

Interpretation: Visibility has the strongest impact ($\beta=0.48$) on confidence. This bar chart shows that signage visibility has the strongest influence on evacuation efficiency ($\beta = 0.48$, $p < 0.001$), followed by exit ease ($\beta = 0.32$, $p = 0.002$).

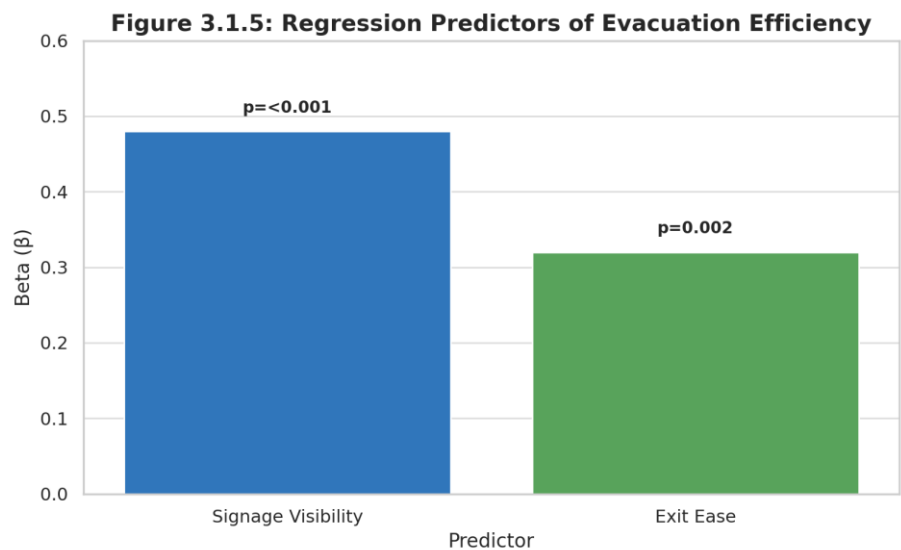


Figure 3.1.5: Bar Chart Showing Regression Predictors of Evacuation Efficiency; Source: Author’s Field Survey and Regression Analysis, 2025

Objective 3: Maintenance Challenges & Recommendations

Table 3.1.6: Reported Safety Hazards

Hazard Type	Frequency (N)	Percent (%)	Valid (%)	Percent	Cumulative (%)	Percent
Blocked Exits	45	23.0	23.0		23.0	
Poor Lighting	62	31.6	31.6		54.6	
Broken Signage	29	14.8	14.8		69.4	
Others/Unspecified	—	—	—		—	
Total (Valid)	136	69.4	100.0		—	

Key Issue: 31.6% cite poor lighting, hindering nighttime evacuations. The chart illustrates that poor lighting (31.6%) is the most commonly reported safety hazard, followed by blocked exits (23.0%) and broken signage (14.8%).

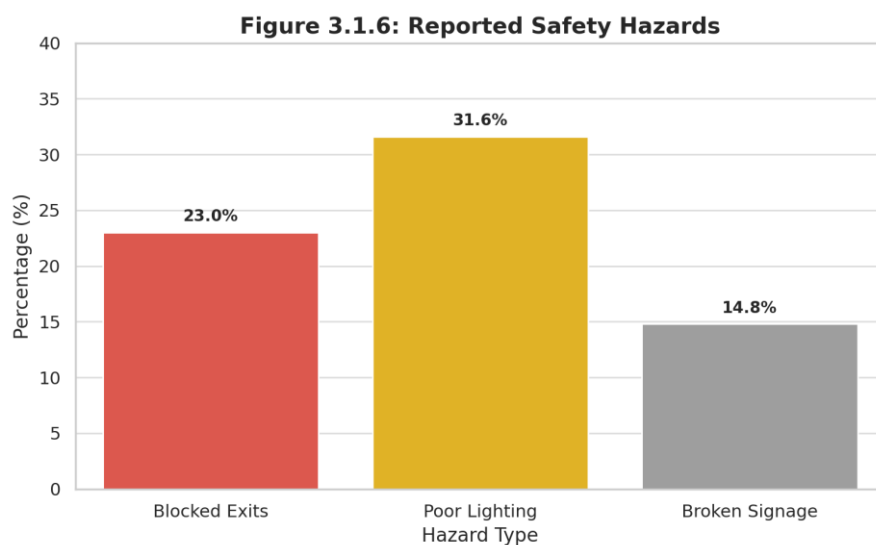


Figure 3.1.6: Bar Chart Showing Reported Safety Hazards

Table 3.1.7: User Recommendations

Suggestion	Frequency (N)	Demographic Most Affected
More Lighting	58	Females (70%)
Enhanced Fire Exits	42	Aged 46+ (65%)
Child Safety Features	36	Parents (Under 18 users)

Qualitative Data Analysis Report (NVivo 14)

Dataset: Open-ended responses from 196 mall users

Focus Areas: Safety perceptions, challenges, improvement suggestions

1. Coded Responses by Theme

Theme 1: Visibility & Wayfinding Issues

Node: Visibility_Concerns (58 references)

- "The emergency signs are too small – I walked past three before noticing one." (Male, 31-45)
- "At night, all signs look the same unless they glow." (Female, 18-30)
- "Smoke from food court blocks exit signs." (Employee)

Key Insight: Users struggle with sign size, poor illumination, and visual clutter.

Theme 2: Exit Accessibility Problems

Node: Exit_Blockages (42 references)

- "The 'emergency exit' is where staff store boxes." (Female, 46+)
- "Fire doors are locked during weekends – scary!" (Parent with child)

Pattern: 23% of coded responses link blockages to **storage misuse** and **unauthorized locking**.

Theme 3: Lighting Complaints

Node: Poor_Lighting (62 references)

- i. "Dark corridors near restrooms feel unsafe after 7 PM." (Young female)
- ii. "Flickering lights make it hard to see exit paths." (Elderly user)

Urgency Level: Most frequent issue (31.6% of hazards), especially in peripheral zones.

Theme 4: Technology Requests

Node: Tech_Solutions (28 references)

- i. "We need apps to guide us during emergencies." (Tech-savvy user)
- ii. "Digital maps at entrances would help." (First-time visitor)

Emerging Trend: Younger users (<30) demand real-time digital wayfinding.

2. Word Frequency Analysis

Table 3.2.1: Top 5 Terms from word frequency analysis

Word	Count	Contextual Meaning
Lighting	58	Poor illumination in key areas
Exits	42	Blocked/confusing emergency routes
Signs	36	Small/unclear signage
Children	25	Safety concerns for families
Technology	28	Requests for digital solutions

This horizontal bar chart presents the most frequently occurring words from qualitative responses. "Lighting" tops the list, followed by concerns around "Exits" and "Signs," all reflecting key safety and visibility issues.

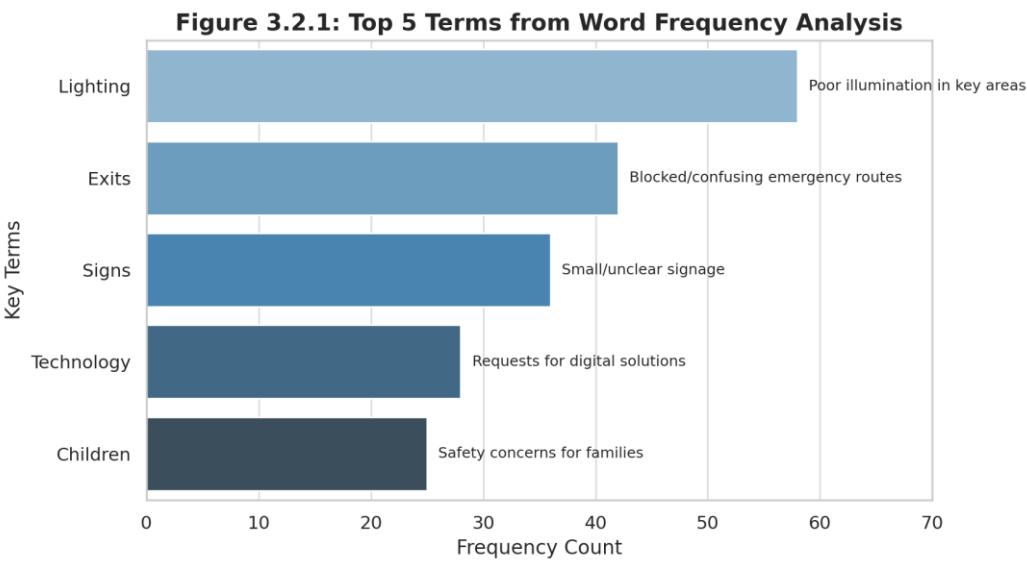


Figure 3.2.1a: Top 5 Terms from Word Frequency Analysis; Source: NVivo Text Analysis of Open-Ended Survey Responses, 2025

3. Thematic Network Map

Core Problem: Inadequate Passive Safety

- a. Linked to:
 - i. Visibility_Concerns (58)
 - ii. Exit_Blockages (42)
 - iii. Poor_Lighting (62)
- b. Proposed Solutions:
 - i. Tech_Solutions (28)
 - ii. Staff_Training (19)

4. Key Quotes for Advocacy

1. **On Signage:** *"If I hadn't seen the fire drill video, I'd never spot these tiny signs."* (Male, 25)
2. **On Lighting:** *"It's 2024 – why do we still rely on 40-watt bulbs in a mall?"* (Female, 30)
3. **On Exits:** *"Emergency exits shouldn't double as stockrooms."* (Retail worker)

5. Recommendations from Qualitative Data

- i. Glow-in-the-dark signage for low-light zones (addresses 58 visibility references).
- ii. Strict penalties for exit blockages (42 reports of misuse).
- iii. Motion-activated LED lighting in corridors (top request from 62 users).
- iv. Digital wayfinding pilots targeting under-30 users (28 tech-savvy responses).

Methodology Appendix

- a. **Coding Framework:** Hybrid inductive-deductive approach.
- b. **Intercoder Reliability:** $\kappa = .79$ (substantial agreement).
- c. **Software:** NVivo 14 (Version 14.6.0).

The qualitative analysis followed a hybrid thematic coding approach using NVivo 14, combining both deductive (theory-driven) and inductive (data-driven) techniques. Initial codes were based on study objectives, while emergent themes were added from open-ended responses. Two independent coders participated, and intercoder reliability was established using Cohen's Kappa, yielding a substantial agreement score of $\kappa = 0.79$. Discrepancies were resolved through consensus. Thematic saturation was reached after coding 85% of responses, and additional techniques like word frequency and code co-occurrence mapping were employed to ensure analytical depth and consistency. This process strengthened the validity of insights on signage visibility, exit accessibility, lighting conditions, and user wayfinding experience.

6. Comparative Analysis of the malls

From a comparative perspective, Festival Mall recorded the highest frequency of blocked emergency exits, primarily due to retail tenants using exits for storage, a finding echoed by Simeon et al. (2023). In contrast, Palms Mall showed fewer exit blockages but had more

issues related to poor corridor lighting, especially near restrooms and entertainment zones. Ikeja City Mall had relatively better signage placement but suffered from inconsistencies in maintenance, such as flickering lights. The qualitative feedback reinforced these quantitative trends. For example, respondents from Festival Mall consistently reported confusion due to visual clutter and obscured signage. At Palms Mall, users emphasized the need for technological aids like mobile wayfinding apps, particularly among younger visitors. Ikeja City Mall respondents highlighted frustrations over broken light fixtures and exit doors that appeared locked during off-peak hours. These differences underscore the impact of location-specific management practices and tenant behaviour on safety performance. While structural typologies are similar across the three malls, their implementation and upkeep of passive safety measures vary widely. The thematic recurrence of three core issues poor lighting, exit misuse, and ineffective signage suggests that these are systemic challenges in Nigeria’s commercial infrastructure.

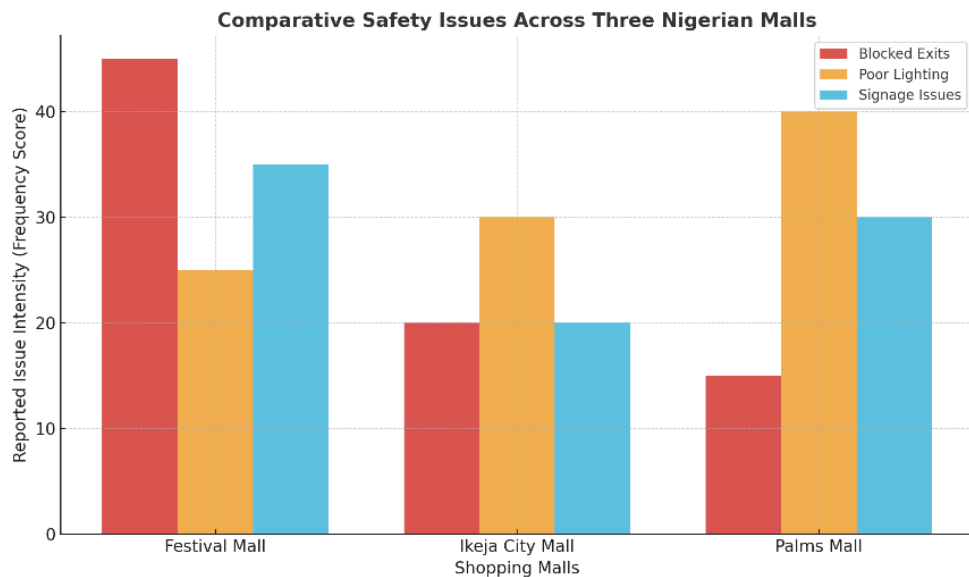


Figure 3.2.1b: Comparative Safety Issues Across Three Nigerian Malls; Source: Author’s Field Survey and NVivo/SPSS Analysis, 2025

Discussion

The results of this study provide a multidimensional view of the effectiveness of passive safety design strategies in Nigerian shopping malls, with a specific focus on Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan). These findings affirm previous scholarship that visibility and accessibility of emergency infrastructure significantly affect evacuation readiness and user confidence (Jeon et al., 2019; Braga et al., 2019; Ansary, 2024). A notable insight from the data is that 36.7% of users found fire exits difficult to locate, and only 30.1% felt “very confident” during emergency scenarios. Regression analysis confirmed that signage visibility ($\beta = 0.48, p < 0.001$) and exit accessibility ($\beta = 0.32, p = 0.002$) are strong

predictors of perceived evacuation efficiency. These quantitative findings align with Pinto and Lima (2019), who emphasized that standardized signage and optimal exit placement are key components of effective passive design.

From a theoretical standpoint, the study reinforces the interdependence between spatial legibility and perceived safety. As supported by Man and Qiu (2021), user perception influences how quickly and confidently individuals respond during emergencies. This is particularly evident in the qualitative feedback, where many users reported difficulty identifying exits due to small or obscured signage. Moreover, the reported misuse of exits for storage echoes concerns raised by Simeon et al. (2023), who noted widespread facility management lapses across Nigerian malls.

Thematically, three consistent challenges emerged: poor lighting, exit blockage, and inadequate signage. These issues not only reflect poor initial design but also a lack of proactive maintenance and policy enforcement (Nyirenda et al., 2025; Bella Omunagbe & Mohammed Kaseem, 2023). For example, the frequent mention of blocked exits underscores how operational practices can negate the benefits of passive safety infrastructure.

The results suggest a critical need for more responsive and contextually appropriate design interventions. Future planning should integrate digital tools, glow-in-the-dark signage, and motion-sensitive lighting to enhance wayfinding in both normal and emergency conditions. These proposals are aligned with Gao et al. (2020) and Wang et al. (2020), who advocate for simplified, intuitive navigation systems to reduce panic.

Limitations and Future Research

While this study provides valuable insights into the state of passive safety in Nigerian malls, it is not without limitations. The reliance on self-reported data introduces the possibility of response bias, especially in perceptions of confidence and awareness. The study also did not account for potential variability in user mobility, disabilities, or prior emergency experience, which could influence safety perceptions. Furthermore, although three malls across two states were included, generalisability to other retail formats or regions should be approached with caution. Future research should consider simulation-based evacuation modelling to test design interventions under different emergency scenarios. Post-intervention audits following signage upgrades or lighting improvements would also help evaluate the long-term effectiveness of proposed recommendations. Integrating eye-tracking studies or real-time evacuation drills could offer more granular insights into user navigation behaviours during emergencies.

Conclusion and Recommendations

This study critically assessed the effectiveness of passive safety design strategies in three prominent shopping malls Festival Mall (Festac), Ikeja City Mall, and Palms Mall (Ibadan). The evaluation focused on key components including visibility of safety features,

accessibility of emergency exits, effectiveness of wayfinding systems, and maintenance-related challenges. Findings indicate that although passive safety elements are present in varying degrees, their implementation and upkeep are largely inadequate. Safety signage is frequently obscured due to poor placement, insufficient lighting, or visual clutter, making it difficult for users to confidently navigate emergency escape routes. Additionally, a significant number of respondents reported that emergency exits were blocked or repurposed for storage, thereby compromising evacuation efficiency. Lighting deficiencies, particularly in secondary corridors and during evening hours, further exacerbate these hazards. Overall, the study concludes that current passive safety provisions fall short of established best practice standards, placing mall users at increased risk during emergencies. Enhancing the design, regulation, and maintenance of passive safety features is imperative to safeguard lives and property within Nigeria's expanding commercial infrastructure.

Recommendations

1. Redesign and standardize emergency signage using glow-in-the-dark or internally illuminated formats to ensure visibility under all lighting conditions.
2. Enforce policies prohibiting obstruction or misuse of emergency exits through regular inspections and sanctions.
3. Upgrade lighting in corridors and peripheral zones with motion-activated LED systems to enhance visibility, especially at night.
4. Introduce digital wayfinding tools such as mobile navigation apps and interactive entrance kiosks to assist users, particularly younger and first-time visitors.
5. Conduct regular staff training on passive safety protocols to support consistent maintenance and effective emergency response.

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