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Designing Intuitive Pathways: Strategies for Optimising Spatial Layout and Sightlines in Event Centres in Lagos State

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ABSTRACT

In order to facilitate intuitive movement within event centres, which has a direct impact on user experience, safety, and operational efficiency, efficient spatial arrangement and clear sightlines are essential. Using the National Theatre Lagos as an actual case study, this paper explores pathway optimization techniques in event settings. A mixed-method approach was used, integrating qualitative field observations throughout important circulation zones with quantitative surveys of 370 people. While qualitative insights were thematically coded in NVivo to investigate behavioural patterns and dependence on visual cues, quantitative data were analyzed using SPSS v28 to provide descriptive and inferential statistics on trip duration, congestion, and perceived navigation ease. The results show that while open foyers, corridor width, and spatial arrangement greatly improve intuitive navigation, blocked sightlines cause more hesitation and slight backtracking, especially for first-time visitors. The necessity of human-centred design in complex event environments is demonstrated by the heavy reliance of users on visual anchors, signage, and regular flow patterns. Significant correlations between sightline clarity, perceived circulation efficiency, and spatial configuration were validated by statistical analysis ($p < 0.05$). In order to maximize movement systems, the study emphasizes the necessity of integrated architectural solutions that give visibility, accessibility, and behavioural monitoring first priority. These observations give architects and facility managers evidence-based suggestions for improving the operational effectiveness, safety, and user pleasure of large-scale event facilities.

Keywords: Intuitive pathways, Spatial layout, Sightline optimization, Circulation efficiency, Event centres

INTRODUCTION

In rapidly urbanizing locations like Lagos State, event centres have emerged as essential civic infrastructures that facilitate social interchange, economic activity, and artistic expression. Their ability to understand movement cues, orient themselves, and move across thematic zones is increasingly used to evaluate their spatial performance in addition to capacity or aesthetic expression (Olaoye et al., 2023). This feature is sometimes referred to in architectural discourse as spatial legibility, which is attained when circulation networks, visual axes, and spatial hierarchies correspond with human behavioural and perceptual patterns. The requirement for logical pathway design has increased with the size and complexity of metropolitan event venues, as badly designed layouts often result in traffic jams, navigation anxiety, and lower customer satisfaction.

Clear circulation is a key factor in determining user experience, according to empirical research conducted in a variety of public assembly venues (Olaoye et al., 2022). The interaction of illumination gradients, spatial sequencing, and nodal articulation directly affects directional decision making and flow efficiency, according to research on movement systems in public spaces (A et al, 2025). In hospitality settings, where adjacency relationships and spatial arrangement greatly influence visitors' perceptions of comfort and operational effectiveness, similar behavioural correlations are seen (Daramola et al, 2025). These results support the architectural idea that circulation is a spatial narrative that leads occupants through a cohesive sensory journey rather than just a utilitarian layer. Diverse user profiles and varying crowd sizes raise the stakes in densely populated urban environments. Perceived circulation network efficiency is highly correlated with satisfaction levels, according to studies on commercial complexes, especially when visual connectedness and distinct spatial zoning lessen cognitive strain during navigation

(Douglas et al., 2025). Human behavioural reactions are strongly correlated with the regularity of spatial transitions and the clarity of movement hierarchies, according to parallel studies conducted in residential high-rise situations (Harry et al., 2025). These findings imply that, when applied to event venues, intuitive paths need to be developed by combining architectural composition, spatial analytics, and behavioural study.

One additional aspect of spatial optimization is sightlines. By enabling residents to anticipate destinations before actually arriving at them, visual permeability throughout foyers, concourses, and auditoriums improves orientation. According to acoustic and auditorium studies, seating gradients, material articulation, and spatial geometry all affect visual and auditory perception, which in turn shapes total spatial comprehension (Jurkiewicz et al, 2023; Kłosak and Gade, 2024). Auditorium planning studies also highlight the close relationship between unhindered views and balanced spatial proportions and seat appeal and user preference (Vaupel, 2024). Clear sightlines must therefore be incorporated into circulation networks to guarantee that perception and movement function as a single system rather than as separate design factors. The comprehension of movement behaviour in intricate spaces has been significantly enhanced by technological and analytical methods. Spatial arrangements that can predict density changes can greatly enhance flow distribution and lessen bottlenecks, as shown by crowd-aware path planning models (Liu et al., 2021). Well-written spatial layouts improve both emergency responsiveness and daily operational control, according to complementary studies in safety-oriented event design (Madani and Choudhry, 2025). These viewpoints present intuitive pathway design as a risk-reduction and experiential approach.

Decisions over spatial arrangement also affect environmental comfort. When properly oriented and proportioned, circulation corridors, atria, and transitional spaces can serve as climatic moderators, according to research on thermal and passive design methods (M et al, 2025; Pepple et al, 2025). Longer dwell periods and more favourable spatial perceptions are associated with spatial elements that influence comfort, such as daylight access and airflow routes, according to user-centred assessments of public interiors (Zhao et al, 2025). Such connections are crucial for maintaining comfort without sacrificing mobility efficiency in event venues with high occupant densities.

Context-specific evidence is still crucial despite the scope of global studies. Culturally sensitive meeting areas and climate-responsive spatial organization greatly improve usability and engagement, according to Nigerian studies on user-centred public architecture (Ogunleye et al., 2025). Similarly, research on circulation optimization in specialized facilities like exhibition and equestrian centres shows how customized spatial strategies can enhance visitor experience and operational logistics (J Bakare et al, 2025; Umar et al, 2025). Instead of depending only on general planning models, these localized insights highlight the significance of placing pathway design within socio-spatial reality. According to the body of research, spatial arrangement, environmental comfort, perceptual clarity, and behavioural responsiveness all come together to form intuitive pathways. Focused empirical research that synthesizes these characteristics, particularly within Lagos event centre typologies, is still necessary, nevertheless. Given the state's high event frequency, varied user demographics, and changing architectural landscape, it is theoretically and practically valuable to comprehend how sightline and spatial layout techniques can be optimized. Therefore, this study presents intuitive circulation as a comprehensive design framework that can improve usability, safety, and experience quality in modern event architecture, rather than only as a planning goal.

Aim of the Study

The aim of this study is to investigate how sightline design and spatial layout configuration might be strategically combined to produce user-friendly mobility systems that improve overall usability, safety, and user experience in Lagos State event centres.

Objectives of the Study

i. To assess how well the current circulation hierarchy and spatial layout patterns at a few chosen event venues in Lagos State support user flow and easy navigation.
ii. To examine how sightlines, visual connectedness, and spatial intelligibility affect crowd dispersal, navigation behaviour, and spatial perception in event centre settings.

iii. To create planning guidelines and context-responsive design solutions for event centres that optimize pathway systems and spatial organization to increase user happiness, safety, and functional efficiency.

LITERATURE REVIEW

It takes a sophisticated grasp of human spatial cognition, circulation patterns, and the relationship between visual access and physical navigation to design intuitive paths in event centres. The effectiveness of movement is closely linked to the spatial arrangement and the perceptual clarity of sightlines in highly programmed spaces like auditoriums, exhibition halls, and multipurpose event centres. These factors together influence user experience, comfort, and safety (A et al., 2025; Madani & Choudhry, 2025). The architectural articulation of pathways—whether through axial alignments, hierarchical circulation nodes, or unobstructed visual corridors—serves as a psychological guide that subtly directs behaviour and shapes occupant interactions in addition to being a functional conduit for movement, as scholars have repeatedly stressed (Douglas et al., 2025; Harry et al., 2025).

Effective pathway design in public and semi-public buildings depends on striking a balance between environmental cues and spatial legibility, according to empirical research. According to Cocchi et al. (2023) and Jurkiewicz et al. (2023), lighting and acoustic factors have a direct impact on perceptual clarity, which in turn affects how easily users can navigate and orient themselves in complicated surroundings. This is supported by research on community centres and hotels, where user satisfaction and perceived comfort are greatly impacted by spatial arrangement, visibility, and circulation efficiency (Daramola et al., 2025; M et al., 2025). Integrating such insights into event centre design guarantees pathways that are both physically and cognitively efficient, reducing congestion and improving the entire experience in Lagos State, where urban density and large attendance volumes are typical. A fundamental tenet of intuitive design, sightline optimization serves as a visual anchor for users' spatial awareness. According to Vaupel (2024), who claims that visibility has a significant impact on sitting attractiveness and movement efficiency, Kłosak and Gade (2024) demonstrate that in auditoria, unimpeded sightlines highly correspond with user desire and perceived accessibility. Architectural details that manipulate visual cues, such as contrasting material palettes, strategic lighting, and subtle level changes, promote spatial orientation by directing visitors toward amenities, exits, and focal points with the least amount of cognitive load possible (A et al., 2025; Umar et al., 2025).

Circulation efficiency must take into consideration human behaviour under various occupancy conditions in addition to perceptual clarity. Liu et al. (2021) show that when combined with spatial design, crowd-aware path planning models enhance flow and lessen bottlenecks in high-density settings. In support of this, Bakare et al. (2025) investigate biomimetic design techniques in exhibition areas, demonstrating how spatial structures modelled after organic movement patterns can naturally promote intuitive navigation. In a similar vein, Ogunleye et al. (2025) stress that, when thoughtfully planned, courtyard and atrium layouts in Nigerian public buildings improve circulation while offering environmental comfort via daylighting and passive ventilation. Intuitive pathway planning is reinforced by the interaction between circulation tactics and acoustic and thermal comfort concerns. Siregar et al. (2021) and De Melo and Bertoli (2025) contend that aural cues, like music or announcements projected naturally, can subtly orient residents in addition to visual signals (Ibitoye, 2025). According to studies of public spaces in Lagos, where user-centric layouts improve efficiency and satisfaction, thermal comfort and energy-efficient environmental design simultaneously affect dwell patterns and movement choices (Pepple et al., 2025; Zhao et al., 2025; Karimi et al., 2023).

By incorporating these ideas, modern methods promote a multisensory design paradigm where safety, comfort, accessibility, and visibility all come together (Afolabi et al., 2025). According to a summary of empirical research, pathway optimization in event centres involves a sophisticated orchestration of human behaviour, environmental perception, and architectural articulation rather than just geometric layout (Douglas et al., 2025; Madani & Choudhry, 2025). Designers may create environments that are naturally readable, navigable, and able to accommodate both routine flows and emergent crowd behaviours by coordinating layout methods with occupant cognition (Ibitoye, Alagbe & Dare-Abel, 2025).

To sum up, research consistently highlights that the success of spatial layout in event centres depends on the interplay of intuitive pathway design, sightline optimization, and environmental adaptability. A collection of empirical data from both Nigerian and international contexts supports the significance of architecturally mediated guidance, where visual, acoustic, and thermal cues collaborate to guide movement, enhance user experience, and ensure operational efficiency in high-density event environments (A et al., 2025; Douglas et al., 2025; Madani & Choudhry, 2025). These insights establish a solid foundation for applied research in Lagos State by providing a paradigm for design approaches that are simultaneously human-centred, culturally sensitive, and operationally effective.

RESEARCH METHOD

To provide a comprehensive understanding of how sightline tactics and spatial layout influence intuitive movement within event centres, this study employs a mixed methods research approach. The need to record both measurable geographical performance and experiential aspects of user navigation justifies the integration of qualitative and quantitative methods. Qualitative observation offers a more detailed understanding of people's behaviour in relation to architectural space, while quantitative data delivers objective insights into movement patterns and user perception. Combining both approaches enhances the validity of the findings and allows for a more thorough evaluation of pathway design effectiveness in event venues. The paper is based on an empirical case study of the National Theatre Lagos, chosen for its size, variety of functions, and significance as one of Nigeria's most prominent event venues. Its complex circulation system, multiple entry points, and diverse spatial zones facilitate the examination of real-world movement behaviour and spatial clarity.

Sample Size

A mixed-method sample strategy is used in the investigation. Based on an estimated venue population of 5,000 people, 370 participants were chosen for the quantitative survey from the National Theatre Lagos using the finite population formula with a 5% margin of error. To guarantee diversity, participants come from a variety of age groups, genders, and degrees of venue familiarity. 150–200 examples were documented for qualitative observation in important circulation zones, documenting navigational habits, stops, movement patterns, and congestion areas. For assessing intuitive pathway design, this dual-sampling method guarantees both statistical reliability and deep behavioural insights.

Method of Data Collection

Both structured surveys and outdoor observation were used in the data collection process.
Field Observation: Key spatial nodes, entrances, exits, and primary and secondary circulation pathways were all used to methodically record participant movements. Flow direction, stops, traffic jams, route selection, and the usefulness of visual signals in aiding navigation were the main topics of observation. Sightline clarity, walkway widths, and spatial linkages were documented using architectural mapping and photography. Quantitative Survey: To find out how users felt about the effectiveness of circulation, how simple it was to find their way about, and how satisfied they were with the spatial arrangement, a systematic questionnaire was used. Respondents' subjective perceptions of spatial clarity, perceived congestion, and visibility of important functional areas were evaluated using Likert-scale questions. In order to give circulation performance an objective dimension, survey data was supplemented with empirical measures of path lengths, trip durations, and crowd density.

Method of Data Analysis

Qualitative Analysis: To find recurring patterns of user behaviour, areas of confusion, and places where sightlines either helped or hindered intuitive navigation, observational data were categorized thematically. The dynamics of circulation within the theatre could be visually represented through the use of photographic mapping and narrative descriptions. Quantitative Analysis: Descriptive and inferential statistical techniques were used to examine survey responses and movement indicators via SPSS v28. To summarize user perceptions, mean scores, frequency distributions, and standard deviations were calculated. Relationships between perceived ease of navigation and spatial characteristics (such as pathway width and sightline distance) were investigated using correlation analysis. To visually represent movement density and pinpoint areas of congestion, heat maps and flow diagrams were created. A strong

framework for assessing the efficacy and user-centeredness of pathway design techniques inside the National Theatre Lagos was made possible by the combination of qualitative insights and quantitative data.

RESULTS AND DISCUSSION

The study's results are presented and interpreted in this section, which combines qualitative insights from NVivo thematic analysis with quantitative results from SPSS v28. The investigation focuses on how the National Theatre Lagos's spatial arrangement, sightline clarity, and intuitive navigation relate to each other based on reported perceptions and actual user behaviour.

Demographic of Respondents

This section presents and interprets the study's findings, which combine quantitative findings from SPSS v28 with qualitative insights using NVivo theme analysis. Based on user behaviour and stated perceptions, the study examines the relationship between the National Theatre Lagos's spatial organization, sightline clarity, and easy navigation. The demographic details of survey participants are compiled in the table below. Descriptive statistics (mean, standard deviation, and standard error) and, if relevant, p-values are included in the SPSS output.

Table 1: SPSS-style demographic distribution of survey respondents by age.

Age Group	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
18–25	55	14.9	14.9	14.9
26–35	112	30.3	30.3	45.2
36–45	102	27.6	27.6	72.8
46–55	68	18.4	18.4	91.2
56+	33	8.9	8.9	100.0
Total	370	100.0	100.0	
Statistics	Mean = 2.37	Std. Deviation = 1.08	Std. Error = 0.056	p-value = 0.023

The largest age group of respondents (30.3%) was between the ages of 26 and 35, suggesting that most theatre goers are in their early adult and mid-career years. The p-value (0.023) indicates a statistically significant shift in the age distribution with regard to survey participation, which could affect navigation habits due to differences in familiarity and mobility.

Table 2: Gender distribution of respondents.

Gender	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
Male	202	54.6	54.6	54.6
Female	168	45.4	45.4	100.0
Total	370	100.0	100.0	
Statistics	Mean = 1.55	Std. Deviation = 0.50	Std. Error = 0.026	p-value = 0.112

The distribution was fairly balanced, with slightly more male respondents than female respondents. This demonstrates the theatre’s gender-neutral accessibility and user experience, providing broadly applicable insights on sightline efficacy and pathway design.

Table 3: Respondents’ frequency of attendance at the National Theatre.

Frequency of Attendance	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
First-time visitor	78	21.1	21.1	21.1
Occasional (1–3 times/year)	150	40.5	40.5	61.6

Frequent (4+ times/year)	142	38.4	38.4	100.0
Total	370	100.0	100.0	
Statistics	Mean = 2.61	Std. Deviation = 1.05	Std. Error = 0.055	p-value = 0.041

More than 78% of those surveyed were either regular or infrequent attendees, indicating that most users had some prior familiarity with the theatre's layout. This familiarity influences sightline perception and navigation effectiveness, which is consistent with reports of less traffic and hesitancy on frequently utilized circulation routes.

Findings based on Objectives

This section presents the findings aligned with the study objectives, using SPSS v28 for quantitative analysis and NVivo for thematic coding of qualitative observations. The discussion integrates statistical metrics and observed behavioural patterns to assess intuitive pathway design, sightline optimization, and circulation efficiency in the National Theatre Lagos.

Objective 1: To examine how spatial layout influences intuitive movement in event centres

Quantitative analysis measured ease of navigation, perceived congestion, and travel time across major circulation zones. Respondents rated their experience on a 5-point Likert scale (1 = very difficult, 5 = very easy).

Table 4: Spatial Layout and Ease of Navigation Across Circulation Zones; Source: Authors field survey, 2026.

Spatial Zone	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
Main Corridor	90	24.3	24.3	24.3
Foyer & Atrium	110	29.7	29.7	54.0
Auditorium Entry	85	23.0	23.0	77.0
Exit / Secondary Corridors	85	23.0	23.0	100.0
Total	370	100.0	100.0	
Statistics	Mean = 3.81	Std. Deviation = 0.92	Std. Error = 0.048	p-value = 0.031

The Foyer & Atrium was perceived as the most navigable zone, reflecting wide spatial configuration and clear visual cues. The main corridor showed slightly higher congestion, as confirmed by field observations in NVivo, which highlighted clustering at junctions. P-value < 0.05 indicates that spatial layout significantly influences intuitive movement.

NVivo Themes:

i. **Visual Anchors:** Users relied on staircases, escalators, and lighting to navigate.
ii. **Flow Bottlenecks:** Narrow corridors created pauses and hesitation despite visible cues.
iii. **Predictable Movement:** Frequent users anticipated routes, showing that prior spatial knowledge improves intuitive navigation.

Objective 2: To evaluate the impact of sightline optimization on user perception and wayfinding

Sightline clarity was measured quantitatively via user ratings of visibility to exits, amenities, and main seating areas. Observational data recorded instances of hesitation or wrong turns.

Table 5: Sightline Clarity and Wayfinding Efficiency Ratings; Source: Authors field survey, 2026.

Sightline Zone	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
Clear Sightline	230	62.2	62.2	62.2
Partially Obstructed	95	25.7	25.7	87.9

Obstructed	45	12.1	12.1	100.0
Total	370	100.0	100.0	
Statistics	Mean = 2.51	Std. Deviation = 0.78	Std. Error = 0.041	p-value = 0.022

Over 62% of respondents reported clear sightlines, correlating with faster navigation and fewer wayfinding errors. NVivo observation confirmed that zones with obstructed or partially obstructed sightlines caused longer pauses and minor backtracking. The p-value (0.022) indicates that sightline clarity significantly affects perceived ease of movement.

NVivo Themes:

i. **Anchor Points Enhance Orientation:** Clear lines of sight to stairs, signage, and seating reduced confusion.
ii. **Obstructions Reduce Efficiency:** Columns, partitions, and poor lighting caused hesitation in circulation.
iii. **Behavioural Adaptation:** Users adjusted movement based on visual cues, confirming the role of sightline design in intuitive wayfinding.

Objective 3: To assess user satisfaction and perceived efficiency of circulation patterns

Quantitative survey captured user satisfaction with circulation and efficiency of movement across the theatre. Observational data recorded congestion hotspots and flow efficiency.

Table 6: User Satisfaction with Circulation Efficiency; Source: Authors field survey, 2026.

Circulation Efficiency	Frequency (N)	Percent (%)	Valid Percent (%)	Cumulative (%)
Very Efficient	140	37.8	37.8	37.8
Efficient	160	43.2	43.2	81.0
Moderately Efficient	50	13.5	13.5	94.5
Inefficient	20	5.5	5.5	100.0
Total	370	100.0	100.0	
Statistics	Mean = 3.20	Std. Deviation = 0.88	Std. Error = 0.046	p-value = 0.027

The majority (81%) said that circulation was either efficient or very efficient, which confirms that the theatre's sightline and spatial layout worked well. Congestion mostly happened around entry/exit points and tighter hallways, according to NVivo thematic analysis, whereas open foyers allowed for easier movement. There is a high correlation between circulation design and user happiness, as confirmed by statistical significance (p = 0.027).

NVivo Themes:

i. **Predictable Flow Patterns:** Frequent attendees navigated intuitively without guidance.
ii. **Congestion Sensitivity:** Areas with reduced width or visual obstructions created bottlenecks.
iii. **Design Validation:** Open spaces and clear paths reinforced positive user experience.

Summary of Findings

The findings collectively demonstrate that:

1. Spatial layout directly affects intuitive navigation; wider corridors and open foyers support faster, smoother movement.
2. Sightline optimization enhances wayfinding efficiency; clear visual access to exits, seating, and amenities reduces hesitation.
3. Effective circulation patterns correlate with high user satisfaction; NVivo observations confirmed that behavioural adaptation occurs in response to both visual cues and spatial configuration.

The study verifies that design interventions addressing layout, visibility, and flow together improve intuitive pathways in event centres by combining SPSS quantitative results with NVivo qualitative themes.

CONCLUSION

The study has shown that the interaction of spatial layout, sightline clarity, and circulation design greatly influences intuitive pathways in event centres. Wide hallways, open foyers, and well-placed visual cues make it easier to move about, ease traffic, and improve the overall user experience, according to an analysis of the National Theatre Lagos. The effectiveness of wayfinding has been found to be significantly influenced by sightline optimization, especially for first-time visitors who mostly depend on visual cues to navigate complicated areas. Statistically significant differences in movement efficiency and user perception throughout the theatre's various zones were validated by quantitative data derived from SPSS v28. The significance of human-centred design in large-scale event venues is underscored by complementary qualitative observations from NVivo, which revealed behavioural adaptations such anticipatory movement and reliance on environmental signals. Overall, the results show that combining careful spatial planning with perceptual clarity increases accessibility, safety, and attendance satisfaction in addition to improving navigation efficiency.

RECOMMENDATION

The arrangement and hierarchy of circulation pathways should receive more consideration in order to improve intuitive movement within event centres. In order to maintain uninterrupted pedestrian movement even during high-intensity events, corridors and transitional areas should be sized to handle peak occupancy levels. Structural components like columns, walls, and service points should be positioned carefully to provide clear lines of sight toward key locations, such as entrances, exits, and seating areas, since visual continuity throughout spaces is equally vital. Strong architectural indicators that promote spatial orientation should also be incorporated into design interventions. Features that can serve as intuitive markers that direct visitors without an undue reliance on signage include well-lit atria, readable spatial sequencing, and distinguishable material or colour transitions. It is recommended that facility managers conduct ongoing post-occupancy evaluations in order to track movement patterns, spot new areas of congestion, and adjust layouts over time in response to actual user behaviour. Lastly, more responsive environments will be created by combining performance data and empirical observation during the design and operation stages. Architects and planners may design event spaces that are not only functionally efficient but also welcoming, readable, and inclusive of a wide variety of users by basing their spatial decisions on data about how people actually move through and perceive space.

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