

Research Article

# Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State in the Design of High-Rise Buildings and Vertical Circulation in the North-Central Zone of Nigeria

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## Abstract

This study conducts a Post Occupancy Evaluation (POE) of the Federal Secretariat in Jos, Plateau State, focusing on the design and efficiency of high-rise buildings and vertical circulation systems in Nigeria's North-Central zone. The research evaluates the effectiveness of vertical circulation systems in terms of user satisfaction, operational efficiency, and challenges affecting productivity and safety. By benchmarking the design of the Federal Secretariat against best practices in high-rise building design, the study assesses maintenance practices and provides recommendations for enhancing future high-rise projects. Employing a descriptive design and survey methodology, data were gathered using questionnaires and semi-structured interviews with a representative sample of stakeholders. The findings underscore the critical role of vertical circulation design in ensuring functionality, improving user experience, and enhancing architectural expression. Key results highlight the importance of accessible and inclusive design options tailored to the building's context and user needs. The study concludes that effective vertical circulation systems are integral to maximizing performance and satisfaction while meeting contemporary standards for safety and sustainability.

## Keywords

Post Occupancy Evaluation (POE), High-rise Buildings, Vertical Circulation Systems, User Satisfaction, Operational Efficiency, Accessibility, Building Maintenance, North-Central Nigeria

## 1. Introduction

Post Occupancy Evaluation (POE) is a crucial process in the lifecycle of buildings, aimed at assessing the performance of a building after it has been occupied for a certain period. This evaluation helps in understanding how well the building meets the needs of its users, its functionality, and its sustainability aspects. The Federal Secretariat in Jos, Plateau State,

serves as an exemplary case for studying high-rise buildings and vertical circulation in the North-Central zone of Nigeria. High-rise buildings are a relatively recent phenomenon in the architectural landscape of Nigeria, driven by urbanization and the need for efficient use of limited land resources [1]. The design and performance of these buildings, particularly in

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terms of vertical circulation—such as elevators, escalators, and staircases—are critical to their success and user satisfaction. Vertical circulation is a key aspect of high-rise building design as it directly impacts the accessibility and movement within the building [2]. Efficient vertical circulation systems are essential for ensuring that the building can handle the flow of people and goods smoothly and safely. Poorly designed systems can lead to congestion, delays, and even safety hazards.

In the context of Nigeria, the Federal Secretariat in Jos stands as a prominent example of a high-rise building whose performance in terms of vertical circulation can provide valuable insights. The Secretariat is a government building that houses various federal agencies and departments, making it a hub of daily activity and a microcosm for studying the effectiveness of vertical circulation systems. The importance of conducting a POE on such a building cannot be overstated. It provides a comprehensive understanding of how well the building serves its intended purpose, identifies areas for improvement, and informs future designs. By evaluating the Federal Secretariat, stakeholders can gain insights into the specific challenges and opportunities associated with high-rise buildings in the region [3]. Moreover, the findings from this study can contribute to the broader discourse on sustainable and user-centric building design in Nigeria. As urban centers continue to grow, the lessons learned from the POE of the Federal Secretariat can guide the development of more efficient and user-friendly high-rise buildings in the North-Central zone and beyond. Moreover, the findings from this study can contribute to the broader discourse on sustainable and user-centric building design in Nigeria. As urban centers continue to grow, the lessons learned from the POE of the Federal Secretariat can guide the development of more efficient and user-friendly high-rise buildings in the North-Central zone and beyond. The focus on sustainability and user experience is particularly relevant in the current global push towards greener and more inclusive urban environments [4].

Post Occupancy Evaluation (POE) offers an assessment tool on the performance of a building after it is engaged to comprehend the collaboration process between the building and the user's needs and to propose ways of refining the environment needed to accommodate user needs, especially in a public building such as a state secretariat [5]. The distinctive characteristic of POE is that it creates references based on users' understanding of the effects of subjected buildings on output and comfort [6]. The secretariat of an organization is the section that accomplishes its central administrative obligations. The word is linked explicitly with governments and intergovernmental organizations such as the United Nations. In contrast, non-governmental organizations, such as the International Organization for Standardization [7], state that their administrative unit is their secretariat. It is the gathering of various ministries or departments of the government that work as a single unit with shared responsibility, as in the case

POE is a tool that considers the actual usage of the built environment, users' views, and necessities.

## 2. Literature Review

The POE process provides value-neutral prompts to stimulate stakeholders to make testable observations about their experiences of buildings' effects on productivity and wellbeing. These observations are clarified and documented by the evaluator. Stakeholders' testable observations will be specific to building design, use, and operating conditions, and these may involve components of POE "negotiation" of all three dimensions of building evaluation to realize the optimum ways of achieving productivity and wellbeing. Recommendations are based on a complete set of stakeholders' observations. Most recommendations are to inform planning and design of future new buildings and operational practices. They also generate some recommendations for modifications to the subject buildings and for changes in the ways that they are used. POE evaluators may recommend monitoring, research, investigation, or project management studies [8].

Some POE include other building studies. POE may incorporate quantitative and qualitative techniques. Most POEs will involve seeking feedback from the occupants of the place being evaluated; this may be achieved through various survey methodologies, including questionnaires, interviews, or focus groups. The occupant feedback may be supplemented by environmental monitoring, such as temperature, noise levels, lighting levels, and indoor air quality. More recently, POEs tend to include sustainable measures such as energy consumption, waste levels, and water usage. Other commonly used quantitative measures include space metrics, for example, occupational density, space utilization, and tenant efficiency ratio. Cost, either expressed as the cost of the project per square meter or the total cost of occupancy, is considered a key metric in building evaluation and may be compared with the occupant feedback to provide a better understanding of value [9]. In architecture, circulation refers to the way people move through and interact with a building. In public buildings, circulation is of high importance; structures such as elevators, escalators, and staircases are often referred to as circulation elements, as they are positioned and designed to optimize the flow of people through a building, sometimes through the use of a core [10].

Circulation plans/design are used by, for example, city planners and other officials (such as county planning officials) to manage and monitor traffic and pedestrian patterns in such a way that they might discover how to make future improvements to the system [11]. New multi-family residential developments, for example, introduce increased volume (and thus density) of traffic flows into their vicinity. City planners might analyze this projected impact and justify charging higher impact fees. In other cases, local residents lobbying against a new development might use circulation plans to justify the denial of a development's building permit, citing

decreased quality due to overcrowding, noise pollution, traffic, and so on. City planners might use main thoroughfares and so on to draw commuter traffic out of local neighborhoods (where excessive traffic is seen by local voters as undesirable) and onto larger roads, which often utilize considerable buffers like setback land and vegetation to divorce nonlocal (commuter) traffic from local (neighborhood) traffic. The planning for internal circulation of people is also important in buildings. Signage can help with wayfinding and should be located at decision points and perpendicular to the path of travel [12].

The design of spatial configuration, finding a satisfactory arrangement of functional elements according to certain objectives and constraints, is required at almost every scale of architectural practice. This task is complex, considers multiple criteria, and is often ill-defined [13]. Building circulation is a key organizing mechanism of layout and communication space as it connects exterior and interior areas and reflects the overall spatial organization of the building. The circulation system is often referred to as a “skeleton” that forms the supporting structure of the building. Its efficiency depends on making the destination evident to the user (groups), so that users can easily direct their movement towards their goals. Thus, circulation reveals in a powerful way how patterns of space and configuration affect users through movement. Existing methods for circulation planning are based on analyses of the physical abilities of different user groups (physical strength, age, disabilities, etc.), which set architectural standards for the dimensions of ceilings, doorways, windows, steps, and the like [14]. According to Hillier, spatial configuration influences human movement flows (the behavior of people moving through space and the decisions they make). Several investigations in the field of spatial cognition pointed to the impact of layout organization on both wayfinding performance and users’ cognitive representation of real-world spatial information [15]. The majority of real-world architectural settings are not based on a single pattern of navigation but comprise a combination of circulation patterns that can be constructed from various geometric rules or by combining elements from the different types. There is no firmly established circulation typology; it has been defined rather informally in architectural literature [16].

For example, Passini suggests that gestalt or ‘good, primal form’ of spatial organization contributes to wayfinding performance. A ‘good form’ of the circulation system (e.g., a square, a cross, an L-shape) can support understanding the complexity of the layout as soon as the person notices the specific single-shape as an underlying ordering principle; this, in turn, can inform and thus support wayfinding behavior [17]. Montello also argued that layouts which resemble a ‘good form’ may be easier to understand; i.e., single, simple-shape layout patterns would thus be easier to cognitively process.

Circulation in building design is not just providing pathways for movement. It involves the strategic planning and design of spaces that facilitate the efficient, safe, and comfortable flow of people within and around a structure.

Though, effectively implementing various forms of circulation is crucial for architects to create buildings that are not only functional but also enhance the user experience. One primary goal in circulation design lies in its directionality. Horizontal circulation refers to the movement of people across a single level, typically facilitated by corridors, hallways, and internal streets. According to Ozkar and Giousouf, the layout and organization of these spaces significantly impact wayfinding, with linear layouts being the easiest to navigate and grid-based layouts posing greater challenges [18].

Vertical circulation, on the other hand, addresses the movement between different levels of a building. This can be achieved through stairs, elevators, escalators, and even ramps. The choice of vertical circulation elements depends on factors like building height, user capacity, and the desired level of accessibility. According to the journal “WhereIsTheNorth,” there is importance in considering various factors like building type, number of users, and direction of travel when determining the size of circulation spaces [19]. While optimizing flow and efficiency is essential, circulation design extends beyond mere functionality. It plays a significant role in shaping the user experience within a building. The aesthetics and spatial qualities of circulation spaces can contribute to a sense of place, identity, and even community. Open-plan corridors with natural light and inviting seating areas can foster interaction and collaboration, while spacious atria can create a sense of grandeur and connection.

Architects can leverage various design strategies to enhance the user experience of circulation spaces. Strategic use of natural light, carefully selected materials, and incorporating visual connections to the exterior environment can all contribute to a more pleasant and enriching experience for building occupants [19]. The effective design of circulation systems requires careful consideration of the building’s specific context and intended users. A hospital, for instance, will have vastly different circulation needs compared to a residential building. Hospitals require designated pathways for patients, staff, and visitors, often segregated for safety and privacy. Additionally, factors like accessibility for individuals with disabilities must be prioritized in circulation design across all building types [20].

Circulation in building design encompasses more than just providing passage. It involves a strategic approach to planning and designing spaces that enable efficient, safe, and enjoyable movement for building users. Through understanding various forms of circulation, their functionalities, and the impact on user experience, architects can create buildings that not only function well but also foster a sense of well-being and belonging for their occupants.

The design of circulation in buildings involves everything from hallways to staircases, and plays a crucial role in functionality, user experience, and overall architectural expression. Some factors influence these design decisions, shaping the flow and experience within a built environment. The

primary function of the building significantly impacts circulation design. An office building requires efficient circulation to facilitate movement between workstations and meeting rooms, while a museum prioritizes clear, intuitive pathways for visitor flow and engagement with exhibits [21]. User needs also play a part. Accessibility considerations, for instance, necessitate wider hallways, ramps, and elevators to accommodate individuals with disabilities as outlined by regulations in the Americans with Disabilities Act (ADA).

Physical characteristics of the building site significantly influence circulation design. Existing structures, topography, and surrounding elements all play a role. For example, a building on a sloping site may incorporate ramps or switch-back staircases to navigate the elevation changes [22]. Similarly, the broader urban context, such as the connection to public transportation or pedestrian pathways, can inform the design of entrances, exits, and overall circulation patterns.

Building codes and regulations establish minimum requirements for safety, accessibility, and fire safety, directly impacting circulation design. These regulations dictate parameters like the width of hallways, stairwell dimensions, and emergency egress routes, ensuring safe and efficient movement within the building [23]. Sustainable design principles are increasingly influencing circulation design. Natural daylighting strategies can utilize strategically placed atriums or courtyards, impacting the way people move through the space and encouraging the use of stairs over elevators. Additionally, biophilic design, which integrates nature into the built environment, can incorporate elements like indoor gardens or open-air walkways, shaping circulation patterns and promoting occupant well-being [24].

The chosen architectural style can also influence circulation design. A Brutalist building, known for its bold geometric forms and heavy materials, might utilize wide, imposing hallways to create a sense of monumentality. Conversely, a minimalist aesthetic might emphasize clean lines and open floor plans, resulting in a more fluid and seamless circulation experience [25]. The design of circulation in buildings is a complex interplay of various factors. Hence, carefully considering the building's function, user needs, site context, regulations, sustainability goals, and desired aesthetic, architects can create efficient, user-friendly, and aesthetically pleasing circulation systems that enhance the overall architectural experience.

### 3. Methodology

This study examines the procedure and methodology on the Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the North Central zone of Nigeria.. Hence a descriptive research design is adopted for this study and to explore the feasibility and conceptualization on Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the

North Central zone of Nigeria.

#### 3.1. Research Design

Research design is the method to provide the answers to the questions stated as well as the objectives for this study. With regards to the aim, objectives, research questions and findings from the reviewed literature of this study, the research strategy adopted for this study is the survey approach. The basic survey method used is the administration of questionnaires. In this primary data research, the primary data is collected from the real estate project sites through efforts of the authors. A questionnaire comprising of insights into the assessment of Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the North Central zone of Nigeria.

##### *Data Collection Procedure*

Data will be collected by means of questionnaire, which is divided into different sections. The questionnaire is designed to collect data to aid in the assessment of a Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the North Central zone of Nigeria.

#### 3.2. Study Population

The target population includes the community, comprising of occupants, staffs, and potential occupants users. A purposive sampling technique was used to select a representative sample of stakeholders, including architects, interior experts, builders, and environmental enthusiasts. Semi-structured interviews are used to obtain data. To ensure validity and reliability, it was piloted with a small group, and questions were refined for clarity and comprehensiveness.

#### 3.3. The Questionnaire

The nature of the study objectives to be achieved and research questions to be answered is a major factor in structuring the questionnaire to provide sufficient data for the purpose the study. Different sections will be designed. To evaluate the assessment of a Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the North Central zone of Nigeria.

#### 3.4. Sample Selection

The population sample includes the homogenous, comprehensive which best represents the population. The population of this study comprises of consultants and contractors. The professionals considered for the sake of the data collection are Architects, Quantity Surveyors, Engineers and Project managers. These professionals cut across the Nigerian construction industry because of the large percentage of these professionals in the area of study.

### 3.5. Sample Technique

Professionals in both the construction and consultancy firms are given the questionnaire. The sampling frame was generated from the list of registered Architects, Engineers, and Project Managers published by the Nigerian Institutes of Architects (NIA), Nigerian Society of Engineers (NSE) and Nigerian Institutes of Building (NIOB), respectively.

### 3.6. Data Collection Instrument

A data collection instrument is a device for collecting the data or measuring the variables which are used for answering research questions [26]. Personally guide was used for this study to get data from respondents administered the questionnaires. The questionnaire guide is used to interview different professionals so as get more knowledge, understanding as well as information.

### 3.7. Analysis of Data and Statistical Tools

In qualitative research, the sample size is often questioned in ensuring the credibility of the data obtained.

### 3.8. Data Confidentiality

Data are collected in raw format and thus the information may be quite difficult to understand. Therefore, raw data needs to be summarized, processed and analyzed. It is important that the information derived from the data should be presented in an effective way so as to communicate the message acrosss. The statistical tools and methods pertinent to the analysis of the primary data collected in this research are frequencies and percentages with the use SPSS.

Due to the sensitivity of some information revealed by the interviewees such as comments, criticisms and personal opinions, data confidentiality needs to be upheld within the degree of consent given by each respondents respectively.

## 4. Result and Discussion

The results obtained so far from the study on Post Occupancy Evaluation of Federal Secretariat, Jos, Plateau State, in the design of High rise buildings and vertical circulation in the North Central zone of Nigeria. The results are presented In tables below.

*Table 1. Gender.*

Gender	Frequency	Frequency%
Male	24.6	49.2%
Female	25.4	50.8%

Gender	Frequency	Frequency%
Total	50	100%
Mean	25	50%
Standard Deviation	5	7%

This table shows the gender. 24.6 of the respondents are male while 25.4 are females.

*Table 2. Age.*

Age	Frequency	Frequency%
Below 25 years	18	36.4%
26-34 years	25	50.9%
35-44 years	3	5.5%
45-54 years	4	7.3%
55 years above	0	0%
Total	50	100%
Mean	13	25%
Standard Deviation	4	5%

This table shows the age. 18 of the respondents are below 25 while 25 are 26-34 Years, 3 are 35-44 years, 4 Are 45-54 years while 0 are 55 years and above.

*Table 3. Profession.*

Profession	Frequency	Frequency%
Architect	15	30%
Buildings Engineer	12	23%
ICT expert	14	28%
Others	10	19%
Total	50	100%
Mean	25	33.3%
Standard Deviation	5	6%

This table shows the profession of the respondents, 15 are in Architect, 12 are building engineers, 14 are ICT experts, 10 are others.

**Table 4.** Work experience.

Work experience	Frequency	Frequency%
1-5 years	40	80%
6-10 years	4	8%
11-15 years	3	6%
16-20 years	2	3.6%
21-25 years	1	2.4%
above 26 years	0	0%
Total	50	100%
Mean	25	50%
Standard deviation	5	7%

This table shows their work experience. 40 of the respondents shace 1-5 years working experience, while 4 have 6-10 working experience, 3 have 11-15 working experience, 1 has 16-20 years working experience and 0 have above 26 years experience.

**Table 5.** The design of spatial configuration, finding a satisfactory arrangement of functional elements is required.

The design of spatial configuration, finding a satisfactory arrangement of functional elements is required	Fre-quency	Frequen-cy%
Strongly agree	19	38.2%
Agree	25	49.1%
Undecided	3	5.4%
Disagree	0	0%
Strongly disagree	4	7.3%
Total	50	100%
mean	25	50%
Standard deviation	5	7%

This table shows the design of spatial configuration, finding a satisfactory arrangement of functional elements is required. 19 of the respondents strongly agreed while 25 agreed, 3 were undecided, 0 disagreed while 4 strongly disagreed.

*Summary of findings*

The majority of respondents expressed agreement with the idea that satisfactory arrangements is required.

**Table 6.** Physical characteristics of the building site significantly influence circulation design.

Physical characteristics of the building site significantly influence circulation design	Fre-quency	Frequen-cy%
Strongly agree	26	51.9%
Agree	22	44.4%
Undecided	2	3.7%
Disagree	0	0
Strongly disagree	0	0
Total	50	100%
man	25	50%
standard deviation	5	7%

This table shows the Physical characteristics of the building site significantly influence circulation design. 26 of the respondents strongly agreed while 22 agreed, 2 were undecided, 0 disagreed while 0 strongly disagreed.

*Summary of findings*

These results indicate that a significant majority of the respondents recognize that it significantly influences circulation design.

**Table 7.** Some factors influence these design decisions, shaping the flow and experience within a built environment.

Some factors influence these design decisions, shaping the flow and experience within a built environment.	Fre-quency	Frequen-cy%
Strongly agree	19	38.2%
Agree	25	49.1%
Undecided	3	5.4%
Disagree	0	0%
Strongly disagree	4	7.3%
Total	50	100%
man	25	50%
standard deviation	5	7%

This table shows the Some factors influence these design decisions, shaping the flow and experience within a built environment. 19 of the respondents strongly agreed while 25 agreed, 3 were undecided, 0 disagreed while 4 strongly disagreed.

The findings suggest that a majority of the respondents recognize theSome factors influence these design decisions,

shaping the flow and experience within a built environment.

**Table 8.** The primary function of the building significantly impacts circulation design.

The primary function of the building significantly impacts circulation design	Frequency	Frequency%
Strongly agree	25	50%
Agree	23	44.6%
Undecided	3	5.4%
Disagree	0	0
Strongly disagree	0	0
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows the The primary function of the building significantly impacts circulation design. 25 of the respondents strongly agreed while 23 agreed, 3 were undecided, 0 disagreed while 0 strongly disagreed.

These results indicate that a significant majority of the respondents recognize the The primary function of the building significantly impacts circulation design.

**Table 9.** The design of circulation in buildings involves everything from hallways to staircases, plays a crucial role in functionality, user experience, and overall architectural expression.

The design of circulation in buildings involves everything from hallways to staircases, plays a crucial role in functionality, user experience, and overall architectural expression	Frequency	Frequency%
Strongly agree	18	36.4%
Agree	25	50.9%
Undecided	3	5.5%
Disagree	4	7.3%
Strongly disagree	0	0%
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows the design of circulation in buildings involves everything from hallways to staircases, plays a crucial

role in functionality, user experience, and overall architectural expression. 18 of the respondents strongly agreed while 25 agreed, 3 were undecided, 4 disagreed while 0 strongly disagreed.

These findings suggest that a majority of the respondents recognize The design of circulation in buildings involves everything from hallways to staircases, plays a crucial role in functionality, user experience, and overall architectural expression.

**Table 10.** Accessibility considerations are paramount. Integrating accessible options like ramps and accessible elevators ensures inclusivity for all users.

Accessibility considerations are paramount. Integrating accessible options like ramps and accessible elevators ensures inclusivity for all users	Frequency	Frequency%
Strongly agree	23	45.5%
Agree	24	47.3%
Undecided	4	7.3%
Disagree	0	0
Strongly disagree	0	0
Total	50	100%
man	25	50%
standard deviation	5	7%

This table shows Accessibility considerations are paramount. Integrating accessible options like ramps and accessible elevator ensures inclusivity for all users. 23 of the respondents strongly agreed while 24 agreed, 4 were undecided, 0 disagreed while 0 strongly disagreed.

**Table 11.** Circulation in building design is not just providing pathways for movement.

Circulation in building design is not just providing pathways for movement. It involves the strategic planning and design of spaces that facilitate the efficient, safe, and comfortable flow of people within and around a structure	Frequency	Frequency%
Strongly agree	30	60.7%
Agree	19	37.5%
Undecided	0	0%
Disagree	1	1.8%
Strongly disagree	0	0

**Circulation in building design is not just providing pathways for movement. It involves the strategic planning and design of spaces that facilitate the efficient, safe, and comfortable flow of people within and around a structure**

	Frequency	Frequency%
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows the Circulation in building design is not just providing pathways for movement. It involves the strategic planning and design of spaces that facilitate the efficient, safe, and comfortable flow of people within and around a structure. 30 of the respondents strongly agreed while 19 agreed, 0 were undecided, 1 disagreed while 0 strongly disagreed.

**Table 12.** The choice of vertical circulation elements depends on factors like building height, user capacity, and the desired level of accessibility.

**The choice of vertical circulation elements depends on factors like building height, user capacity, and the desired level of accessibility**

	Frequency	Frequency%
Strongly agree	23	46.4%
Agree	18	35.7%
Undecided	4	8.9%
Disagree	4	8.9%
Strongly disagree	0	0
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows The choice of vertical circulation elements depends on factors like building height, user capacity, and the desired level of accessibility. 23 of the respondents strongly agreed while 18 agreed, 4 were undecided, 4 disagreed while 0 strongly disagreed.

These findings highlight the choice of vertical circulation elements depends on factors like building height, user capacity, and the desired level of accessibility.

**Table 13.** While optimizing flow and efficiency is essential, circulation design extends beyond mere functionality.

**While optimizing flow and efficiency is essential, circulation design extends beyond mere functionality**

	Frequency	Frequency%
Strongly agree	25	50%
Agree	19	37.5%
Undecided	5	10.7%
Disagree	1	1.8%
Strongly disagree	0	0
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows While optimizing flow and efficiency is essential, circulation design extends beyond mere functionality 25 of the respondents strongly agreed while 19 agreed, 5 were undecided, 1 disagreed while 0 strongly disagreed.

These findings highlight the influential role of While optimizing flow and efficiency is essential, circulation design extends beyond mere functionality.

**Table 14.** Architects can leverage various design strategies to enhance the user experience of circulation spaces.

**Architects can leverage various design strategies to enhance the user experience of circulation spaces.**

	Frequency	Frequency%
Strongly agree	21	41.8%
Agree	21	41.8%
Undecided	5	9.1%
Disagree	3	5.5%
Strongly disagree	1	1.8%
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows the Architects can leverage various design strategies to enhance the user experience of circulation spaces. 21 of the respondents strongly agreed while 21 agreed, 5 were undecided, 3 disagreed while 1 strongly disagreed. These findings highlight the significant impact of Architects can leverage various design strategies to enhance the user experience of circulation spaces.

**Table 15.** The effective design of circulation systems requires careful consideration of the building's specific context and intended users.

The effective design of circulation systems requires careful consideration of the building's specific context and intended users	Frequency	Frequency%
Strongly agree	21	41.1%
Agree	25	50%
Undecided	0	0%
Disagree	2	3.5%
Strongly disagree	3	5.4%
Total	50	100%
mean	25	50%
standard deviation	5	7%

This table shows the The effective design of circulation systems requires careful consideration of the building's specific context and intended users. 21 of the respondents strongly agreed while 25 agreed, 0 were undecided, 2 disagreed while 3 strongly disagreed. These findings highlight the important role of The effective design of circulation systems requires careful consideration of the building's specific context and intended users.

This table shows the The chosen architectural style can also influence circulation design..20 of the respondents strongly agreed while 19 agreed, 10 were undecided, 2 disagreed while 0 strongly disagreed. These findings highlight

the positive impact of The chosen architectural style can also influence circulation design.

**Table 16.** The chosen architectural style can also influence circulation design.

The chosen architectural style can also influence circulation design.	Frequency	Frequency%
Strongly agree	20	39.3%
Agree	19	37.5%
Undecided	10	19.6%
Disagree	2	3.6%
Strongly disagree	0	0%
Total	50	100%
mean	25	50%
standard deviation	5	7%

*Design Solutions and Conclusion*  
*Site and Environmental Analysis*  
*Site Location*

The federal secretariat is located in the heart of the southern part of Jos (Jos South). Its sits across the Tudun Wada GRA (Apollo Crescent) of the city. The secretariat can be accessed through the Jos-Bukuru Road and it has a close proximity to the Jos main market.



**Figure 1.** Site and boundary location of the Federal Secretariat, Jos, Plateau State.

*Site Description*

- 1) Location: Central area of Jos, Plateau State, along Jos-Bukuru Road.
- 2) Nearby Landmarks: Plateau State Government House, Jos Main Market.
- 3) Architecture: The Federal Secretariat features modern office buildings with multiple floors. It includes several blocks designed to accommodate the offices of federal ministries, departments, and agencies operating within the state.
- 4) Facilities: The complex is equipped with essential amenities such as parking spaces, security posts, and access control points. It also has provisions for utilities such as electricity, water supply, and communication networks.

*Site Analysis*

The site analysis for Federal Secretariat reveals unique geographic and contextual characteristics of the area;

- 1) Located in Jos, Plateau State, characterized by a moderate climate and hilly terrain.
- 2) Environmental considerations include solar orientation for passive heating and cooling strategies due to its inland location.

*General Climate Characteristics:*

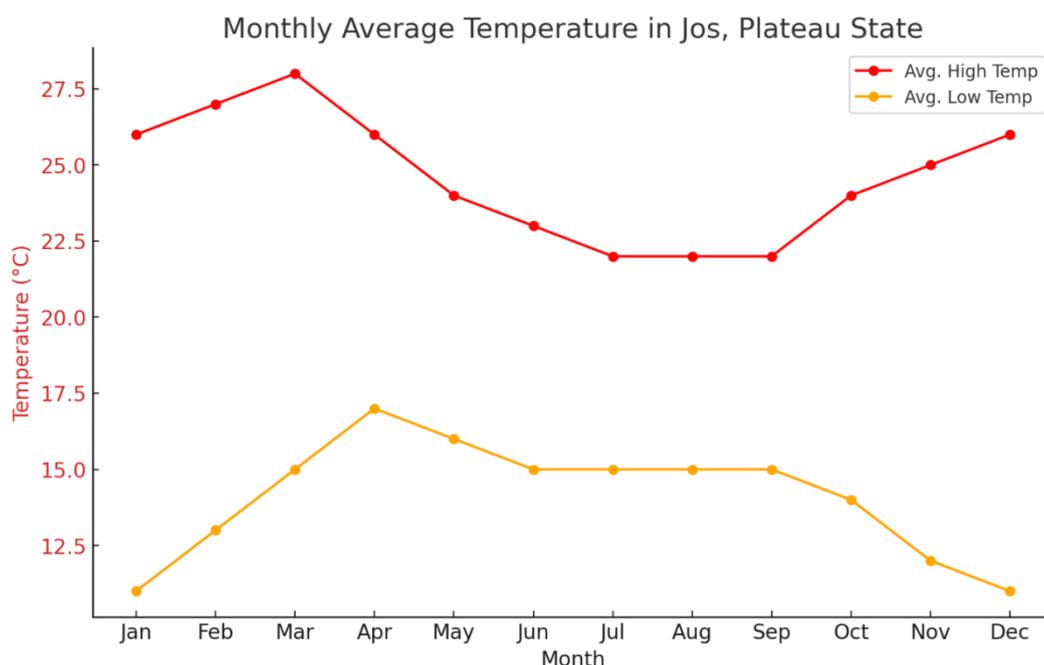
- 1) Climate Type: Temperate
- 2) Temperature Range: 11°C (52°F) to 28°C (82°F)
- 3) Wet Season: April to October
- 4) Dry Season: November to March
- 5) Annual Rainfall: Approximately 1,400 mm (55 inches)

6) Humidity: Generally higher during the wet season and lower during the dry season

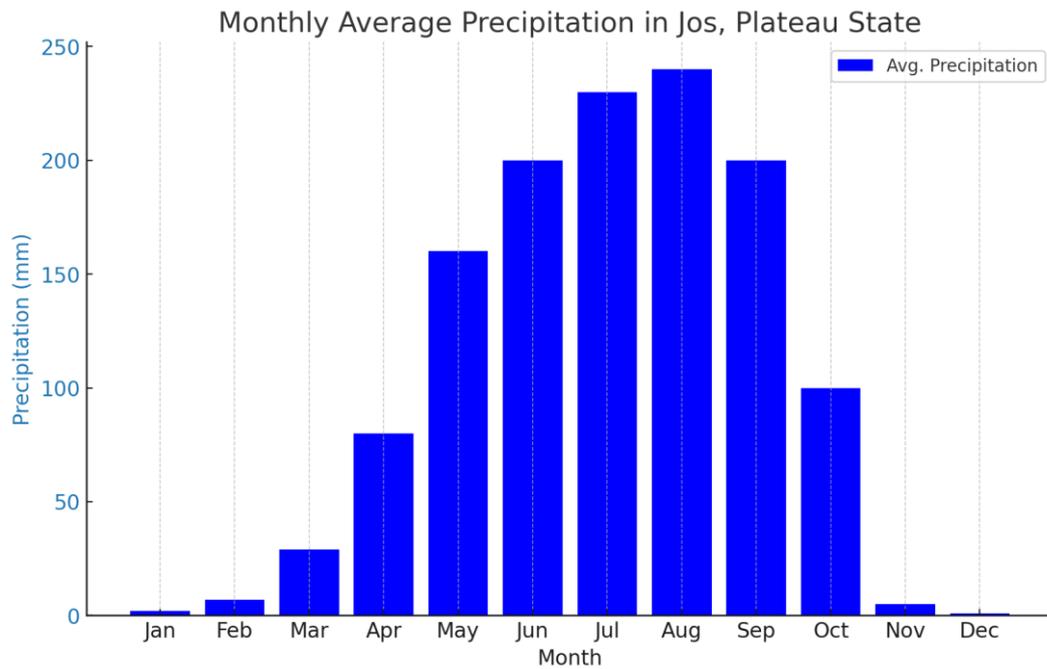
*Table 17. Monthly Average Temperature and Precipitation.*

Month	Avg. High Temp (°C)	Avg. Low Temp (°C)	Avg. Precipitation (mm)
January	26	11	2
February	27	13	7
March	28	15	29
April	26	17	80
May	24	16	160
June	23	15	200
July	22	15	230
August	22	15	240
September	22	15	200
October	24	14	100
November	25	12	5
December	26	11	1

Temperature and Precipitation Charts:



*Figure 2. Monthly average temperature in Jos, Plateau State.*



*Figure 3. Monthly average precipitation in Jos, Plateau State.*

#### *Design Criteria*

- 1) Efficient space utilization for government functions.
- 2) Vertical and Horizontal circulation.
- 3) Energy Efficiency.
- 4) Sustainable design and maintenance practices.
- 5) Integration of local materials where required.
- 6) Climate-responsive design.

#### *Approach to Design*

- 1) A Detailed examination of the architectural and engineering strategies applied to achieve the design objectives of the secretariat.
- 2) Rehabilitation of the elevators that serve as a means of vertical circulation in the building, and renovating parts of the building with Significant or any lapses.
- 3) A study into the exploration of solar energy to power the secretariat will also be done. This will greatly aid the energy efficiency of the building if executed properly.

## 5. Conclusion

In conclusion, the comparative analysis of government buildings in Nigeria and the UK provides valuable insights into the influence of cultural context, climate, and historical significance on architectural design decisions. The study emphasizes that the evolution of government building design in both regions is increasingly geared towards sustainability, efficiency, and user-centric approaches.

The investigation into vertical circulation systems, supported by a post-occupancy evaluation, underscores the critical role these systems play in enhancing a building's functionality and overall user satisfaction. Findings reveal that

optimized vertical transportation systems—elevators, escalators, and staircases—significantly contribute to improved convenience, safety, and accessibility for users, while reducing wait times and increasing operational efficiency. Key challenges such as overcrowding, maintenance issues, and accessibility shortcomings were identified, highlighting areas for improvement.

Moreover, the integration of advanced technologies, such as smart elevators and real-time monitoring systems, is shown to be essential for enhancing the adaptability and energy efficiency of vertical transportation systems. A holistic approach to design and management, prioritizing user experience and leveraging technological innovation, is crucial for addressing the diverse needs of building occupants.

This research offers important contributions to architectural design and building management, providing practical recommendations for improving the design and operation of vertical circulation systems. By applying these insights, future government buildings can better align with sustainability goals, enhance user satisfaction, and ensure efficient, safe, and accessible vertical transportation.

## 6. Recommendation

Based on the lessons learned from the case studies, it is recommended that future government building projects emphasize sustainable design principles from the outset, incorporating passive design strategies and renewable energy sources to reduce environmental impact. Interdisciplinary collaboration between architects, engineers, and stakeholders should be fostered to ensure that building performance and

user experience are optimized. Additionally, incorporating flexibility in design is crucial to accommodate evolving governmental needs and technological advancements, ensuring that buildings remain functional, efficient, and adaptable over time.

## Abbreviations

POE	Post Occupancy Evaluation
BCO	British Council for Offices
ADA	Americans with Disabilities Act
MNC	Multinational Corporation
USA	United States of America
UK	United Kingdom

## Conflicts of Interest

The authors declare no conflicts of interest.

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