

**Proposed Shopping Mall for CECI Supermarket Nig, Limited in Ibadan, Oyo State, Nigeria  
(An Assessment of Circulation in a Public Place Design, Case Study of Shopping Mall in  
Ibadan, Oyo State, Nigeria.)**

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**Being a M.Sc Thesis Submitted to the Department of Architecture, Faculty of Environmental  
Design And Management Studies, Lead City University Ibadan, Oyo State, Nigeria.**

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(Msc) in Architecture.**

**2023**

### **Certification**

This is to certify that this research thesis was carried out by Mr. Odor Ogechukwu Emmanuel with Matric No. LCU/PG/002735 carried out Assessment of Circulation in a Public Place Design, Case Study of Shopping Mall in Ibadan, Oyo State, Nigeria in the Department of Architecture, Faculty of Environmental Design and management Studies, Lead City University, Ibadan, Oyo State, Nigeria for the award of Master of Science (M. Sc.) degree in Architecture. To the best of my knowledge, it has not been presented in any previous application for any degree of this or any other University. I ensured that there was no conflict of interest and all sources of information quoted have been duly acknowledged by means of references.

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## **Dedication**

This project is dedicated to God Almighty for seeing me through to this end. All glory, honor and adoration be unto his name.

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## **Acknowledgement**

This project would not have been possible to this end without the priceless care of goodhearted people who in several ways made contributions and assistance. In gratitude of this fact I sincerely acknowledge the following people for the inestimable roles they played in realizing this dream.

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## Abstract

Consumption of goods and services are phenomenon required by men around the world to satisfy their daily needs which has transformed into a particular centre to seek such goods and service. Hence shopping mall as of the places where citizen by all classes of people regardless of their ability, age, race, ethnicity, social-economic level has access to such goods and services usually lead into a centre of high activities culminating in high human (pedestrians) and vehicular movements. This movements usually generate congestion when they are not properly organized. Most of existing shopping in a case study area are faced with circulation challenges in both exterior and interior parts of the building. However, there is need to mitigate such problems by proffer architectural measures to deploy towards enhancing them. Ibadan in Oyo State as one of the larger cities in west African was taken as the study area and other nearby cities such as Lagos, Osogbo (Osun State) and other shopping mall (public places) outside the county of the study area may be considered as a representative in relating to challenges addressed. The aim of this research design thesis is to assess and evaluate the circulation systems in shopping malls in the study area. Selected international and local shopping malls are used as the case study, descriptively analyzed according to the major subject matters and the result of the observation shows merit and demerits of universal design of malls across the globe. Hence provide a comfortable shopping environs for shoppers.

**Keywords:** Circulation (Vertical and Horizontal), Architecture of Public Space, Accessibility, Shopping Mall Classification.

**Word Count:** 262

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## Chapter one

### Introduction

#### 1.1 Background to the study

Circulation in architecture can be expressed as circulation within spatial unit, vertical circulation and horizontal circulation which play an important role in our emotion towards the building be it comfort. The movement of people is crucial in public buildings. These buildings are intentionally designed and situated to ensure a smooth and convenient flow of individuals, allowing easy access to various circulation elements like stairs, corridors, elevators, parking lots, etc. An accessible route is a pathway for pedestrians that is easily accessible typical, these routes connect various parts of a building to public spaces, entrances that are accessible, transportation stops, and other places that can be reached both within the premises and within the building, such as different floors and mezzanine levels. (Janis, 2019).

Public spaces like shopping malls should ideally be designed with circulation elements that cater to the needs of all users, ensuring positive experiences. However, in many cases, these buildings do not offer sufficient accessibility for the comfort of their users. To improve our interactions with such spaces, it is important to view them as places that promote well-being and positive engagement. Unfortunately, individuals with disabilities often do not experience the same level of positive engagement in these public spaces. (Poldma *et al*, 2014). The design of the built environment following the sal approach ensures that people of all ages and abilities have equal access to both indoor and outdoor spaces in public areas. It is important for every individual using these spaces to be able to fully participate in social activities. Social participation means being able to freely navigate one's surroundings and engage in various activities, such as work, transportation, and social interactions. (Ward, Mitchell, & Price, 2007). However, access to certain environment is often granted to some individual while being denied to others.

In 2010, the Council of Shopping Centre, along with other commercial establishments, defined a shopping centre as a collection of retail outlets that are designed, built, owned, and operated as one property, usually offering parking facilities.

Architect Victor Gruen introduced the concept of shopping malls (Gruen, 1973) with the intention of creating an innovative structure that combines various urban functions, including commercial and social aspects. However, over time, shopping mall owners have abandoned the noncommercial elements in order to expand the malls beyond their original intended size (Ester, 2017). This was done to maximize profits, but in the process, important considerations related to circulation and other essential matters were overlooked.

In the architectural design or pattern of the public buildings such as shopping malls, circulation is very essential with serious concern. Hence, the aim of this study is to address issues by examining how people move within shopping malls, identifying shortcomings in the accessibility of buildings, and proposing superior design solutions to enhance user-friendly conditions in the constructed surroundings.

## **1.2 Statement of the Research Problem**

According to Azuine (2005), if the organization of human circulation within a building is not done properly, it can lead to disorder and danger to human lives, particularly when there is conflict between human and vehicular circulation. Azuine pointed out that the smooth functioning of a center depends heavily on the management of people and vehicle flow. Consequently, creating a suitable circulation pattern and ensuring accessibility measures are key challenges in a shopping center.

Nevertheless, in Ibadan, the majority of the current shopping centers experience difficulties with their flow of people. The current circulation pattern lacks organization and clarity. This study aims to assess and analyze the circulation system and entrances of shopping malls in a specific region in order to identify areas of poor movement and propose improvements for better flow within the mall.

The objective is to evaluate the level of ease and efficiency of movement in existing shopping malls and understand how their circulation systems can be enhanced through effective design.

### **1.3 Research Questions**

To understand the empirical situation on the ground, it is crucial to first gain knowledge of the academic literature on public spaces, circulation, and shopping centers. The main question of research is divided into the following four;

1. What are the key causes of unplanned circulations in public space, a case study of shopping mall?
2. What are the necessary facilities needed to enhance proper circulation in public place such as shopping mall?
3. What are the importance of vertical and horizontal circulation system in a public space?
4. what other issues aside circulation system usually disturbed activities within public buildings?

### **1.4 Aim and Objectives of the Proposed Project**

#### **Aim**

The aim of this research is to solve the challenges pebbledash circulation in a shopping centre and to design an effective and organized circulation pattern measures using architectural approaches which would advance effectiveness in a shopping centre.

#### **Objectives**

1. To outline the issues of an unintended movement within a shopping setting.
2. To enumerate the essential amenities required to improve the flow of foot traffic in a shopping complex.
3. To prioritize the implementation of vertical and horizontal systems of movement.
4. To take into account the placement of adequate sources of lighting and designated areas for checkpoints within the shopping center and its surroundings.

### **1.5 Significance of the Study**

Effective circulation measures are essential in shopping malls and cannot be ignored. Neglecting circulation can lead to risks to human lives and property, and not considering the necessities and

design philosophies during the planning phase can negatively affect its functionality. Shopping malls offer not just basic shopping needs but also recreational and entertainment facilities, attracting people for various other reasons. Thus, there is a growing demand for a comfortable and secure shopping environment. Ibadan, as a viable city business people, is a fast growing and developing ultra-urban centre with increasing invasion of retailers. The demand for a comfortable shopping area is growing, making it necessary to address circulation issues in shopping centers. Hence, the main purpose of this research is to find a solution to these problems.

## **1.6 Scope to the Study and Contribution to Knowledge**

The goal of this study is to evaluate the ease of access to existing shopping malls by examining the pathways and entrances in the designated area.

To create an environment that both shoppers and services renders will have positive comments to share on their first adventures entering or and day to day activities in the shopping mall.

There by assisting architects and other designers in providing the circulating system measures that could be used as point of reference.

## **1.7 Study Area**

The city of Ibadan was created in 1829 as a war camp for warriors coming from Oyo, Ife, and Ijebu. A forest site and several ranges of hills, varying in elevation from 160 to 275 metres, offered strategic defense opportunities,

Ibadan is the largest indigenous city in West Africa and is located in the South-Western part of Oyo State of Nigeria. It is the capital city of Oyo State and is located about 145km North-East of Lagos, the commercial capital of Nigeria. Its population of 2,550,593, includes 11 local government areas. The population of central ibadan, including five LGA s, is 1,338,659 covering an area of 128 Km<sup>2</sup>.

### **1.6.1 Commerce and Trade**

While the people were predominately farmers, some engaged in trading. The central market at Ojaoba was the economic nerve centre of the town, traders from the neighbouring countries of the

Egba and Ijebu attended the market in the town, bringing coaster goods like salt, dried fish, and European commodities. Female indigenous traders too, left the town to attend the markets in Apomu, Ikire, and some villagers in the Ife kingdom.

The location of Ibadan also favoured trading activities. The state had the economic advantage of being located on a network of communication routes. It could easily be linked with the older Yoruba states and with the ports in Lagos, Porto Novo, and Badagry through the Egba, Egbado, and Ijebu territories. These three ports were important because of the lucrative trade in slaves and later in agricultural products with the Europeans on the coast. Ibadan succeeded exploiting this advantageous location to establish trade contacts with many other parts of Yorubaland and beyond.

### 1.7 Operational Definition of Terms

1. **Circulation:** Circulation refers to the pathways within a floor plan, which are critical in shaping our architectural experience. The design of these pathways plays a significant role in determining the success or failure of a plan.
2. **Accessibility:** This refers to designing and constructing spaces to be inclusive and usable by as many individuals as possible, including those with incapacities.
3. **Shopping Mall:** According to the International Shopping Council of Shopping Centers (ICSI), the definition of shopping malls is open or closed independent bazaars that consist of a single building or group of structures and contain more of different retail type
4. **Airport mall:** Refers to a collection of specialty retail stores, restaurants, and various other services that are primarily found within airports.
5. **Arcade:** A popular type of urban shopping center in the 19th century, featuring a glass roof and shops on either side of a pedestrian passageway that often-connected parallel streets.
6. **Enclosed mall:** A shopping center entirely inside a roofed structure, with limited entrances and stores accessible through interior corridors.
7. **Entertainment complex:** A shopping center with theaters, restaurants, amusements, and related retail stores.

8. **Fashion mall:** A shopping center with stylish clothing, posh merchandise, and quality consumer goods.
9. **Galleria:** A glass-roofed mall or courtyard, influenced by European Victorian-era shopping arcades.
10. **Mall:** A large shopping center with parking and additional buildings, typically enclosed.
11. **Mixed-use center:** A complex that includes residences, offices, restaurants, theaters, hotels, and retail stores.
12. **Open-air:** A shopping center where stores are directly accessible to the public, with possible covered walkways but no single roof.
13. **Strip:** A small open-air neighborhood shopping center with at least three stores in a connected row facing a parking area.
14. **Urban mall:** A shopping center located within a city, potentially spanning multiple levels with multi-level parking.
15. **Value-oriented mall:** A large shopping center specializing in low-end, discount, and outlet stores.
16. **Village center:** An open-air shopping center with multiple wings and a central plaza.
17. **Anchor Stores:** the largest retail outlets, usually located at the ends or corners of shopping centers, and chosen in part for their potential to attract customers to the shopping center generally; departments store usually anchor regional and superregional malls and supermarkets are typical anchors in community centers.
18. **Food Court:** a separate area of a shopping center containing fast-food outlets and a common seating area.
19. **Free-Standing Store:** a retail outlet not associated with a shopping center, especially those at a distance from congested shopping areas and downtowns.

## **Chapter Two**

### **Literature review**

#### **2.0 Introduction**

The mall is a worldwide trend that originated from traditional open-air markets where locals bought products from artisans, ranchers, and craftsmen. Modern shopping malls, which emerged at the start of the twenty centuries, have now spread across major cities globally in various forms. Apart from being a destination for shopping, malls have also become cultural hubs where individuals of all ages can interact.

#### **2.1 Historical Background**

The first known shopping mall is located in Damascus, Syria and is called Al-Hamidiyah Souq in Damascus, Syria is believed to be the first shopping mall. It was established in the seventh century. Isfahan's Grand Bazaar, built in the tenth century and mostly covered, has a long history. Tehran's Grand Bazaar is also covered and stretches for 10 kilometers. Istanbul's Grand Bazaar, constructed in the 15th century, is one of the largest covered markets worldwide, featuring over 58 streets and 4,000 shops. Gostiny Dvor in St. Petersburg, which opened in 1785, is one of the earliest purposely-built mall-style shopping complexes. It has over 100 shops and covers an area of over 53,000 m<sup>2</sup>. The Oxford Covered Market, established in 1774 in Oxford, England, is still operational today.

The Burlington Arcade in London was established in 1819, and it served as the prototype for the retail arcade concept in the United States when the Arcade in Providence, Rhode Island opened in 1828. This early model of a shopping arcade paved the way for today's shopping malls. The Galleria Vittorio Emanuele II in Milan, Italy, which appeared in the 1870s, was more reminiscent of the spaciousness seen in modern mega malls. Other major cities like Cleveland, Dayton, and Moscow also constructed similar arcades and shopping centers in the late 19th and early 20th centuries, with notable examples being the Cleveland Arcade, Dayton Arcade, and Moscow's GUM, established in 1890. As the automobile became increasingly popular, shopping centers

catering to this mode of transportation emerged, such as the Market Square in Lake Forest, Illinois in 1916 and the Country Club Plaza in Kansas City, Missouri in 1924.

The Lake View Store in Morgan Park, Duluth, Minnesota, was an early example of an indoor shopping center in the United States. It was built in 1915 by the architect firm Dean and Dean from Chicago, and George H. Lounsberry from Duluth was the building contractor. The shopping center had two floors and a basement, with stores originally present on all three levels. These stores were located inside the shopping center, with some accessible from both the inside and outside. In the middle of the 20th century, a new type of shopping center emerged in suburban areas, coinciding with the growth of suburbs and automobile culture in the United States.

## 2.2 Type

There are different types of shopping malls that are worth noting. The average shopping mall is smaller than 400,000 square feet, but those that range between 400,000 and 800,000 square feet are called regional shopping malls. These larger malls can accommodate luxury stores that need more space.

**Super-regional malls:** The premier shopping malls for the nearby areas and suburbs are those that exceed 800,000 square feet in size.

**Strip malls:** Typically, these areas are found exclusively in the suburbs, characterized by extensive parking spaces and bounded by one-story shops.

**Outlet malls** are superior shopping malls are places where producers have their own stores to sell their products directly.

## 2.3 Features

The initial shopping malls consisted mostly of separate shops and a few food sellers spread out. Before long, food courts were introduced to provide customers with a centralized dining area, as well as a wider range of food options. Throughout the 20th century, other enhancements were

made to shopping malls, such as the inclusion of department stores. These were added in order to sustain larger-scale shopping operations that required significant financial resources.

## **2.4 Size**

Between 1986 and 2004, the West Edmonton Mall in Alberta, Canada held the title for being the biggest shopping center globally. However, within a short span of less than four years, it dropped to the fourth position, highlighting the rapid expansion of shopping malls in recent times. Presently, the largest mall worldwide is the newly established Mall of Arabia in Dubai, with a colossal area of 929,000 sqm. The second and third largest malls are situated in China and Malaysia, respectively.

## **2.5 Potential**

The current history of shopping malls shows contrasting outcomes for their future. Strip malls have lost popularity and power shopping centers have taken their position. These centers house large retailers that offer goods at cheaper prices compared to local stores. In areas with expensive land, vertical shopping malls resembling skyscrapers are being built. It is predicted that in the future, most novel malls will grow vertically instead of horizontally, and will include parking facilities.

### **2.5.0 Classifications of the Shopping Mall**

#### **2.5.1 Classification of Shopping Malls in Europe according to ICSC Standards**

According to (Gamze, 2021) in 1957, the International Council of Shopping Centers (ICSC) was established with the aim of leading the development of shopping centers. Its goals include encouraging research in architectural design and ensuring good management through a circulation system. The council evaluates shopping malls based on their size and capacity, defining them as real estate with leasable areas (L.A.) of 5,000 m<sup>2</sup> or more. These malls are built and managed holistically, can have functions other than trade, and offer common areas. Shopping centers are assessed based on their structural size, diversity, use as economic and cultural symbols, and spatial characteristics. ICSC also categorizes shopping centers based on their orientations and locations.

For the improvement of spatial structure and standards, different classifications have been made for the United States and European countries, taking into account various parameters. In Europe, there are various classifications used to categorize buildings and establishments. These classifications range from standard ones, such as Extra Large, Large, Medium, and Small Scale, to more specific ones like Retail (Large, Medium, Small), Factory Sales, and Themed Centers. The categorization is based on factors including the size of the structure, the size of the leasable area, the number of main stores, and the type of commercial activities taking place.

**Table 2.1: Classification of Shopping Malls in Europe according to ICSC Standards**

		Shopping Centre Type	L.A. (m <sup>2</sup> )	Description
Standard		Very large scale	80.000 ≥	At least 3 main stores, area of influence 8-40 km.
		Large scale	40.000-79.999	At least 2 main stores, area of influence 8-24 km.
		Medium scale	20.000-39.999	Supermarket and main store (daily need), area of influence 5-10 km.
		Small scale	5.000-19.999	Supermarket and at least 2 main store, area of influence 5-10 km.
Features	Shopping parks	Large	20.000 ≥	Designed in a traditional street-street layout, it is compatible with traditional art structures
		Medium	10.000-19.999	
		Small	5.000-9.999	
		Factory Outlets	5.000 ≥	It consists of stores where discounted products are sold. It is generally far from the city centre.
	Theme centres	5.000 ≥	A small number of large stores were created by combining architecture and products in one theme.	

Source: [www.innovativegis.com/basis/mapAnalysis/Topic6/Topic6\\_files/image003.png](http://www.innovativegis.com/basis/mapAnalysis/Topic6/Topic6_files/image003.png)

**2.5.2 Classification of shopping Mall in the USA according to ICSC standards**

Geç (2008) categorized shopping malls in the USA based on ICSC standards into two main groups: Open-Air Centers (which include Neighbourhood, Communal, Life, Power, Themed, and Outlet Centres) and Indoor Shopping Centres (comprising Regional and Super-Regional Centres). These groups are determined by factors such as their size, location, and overall concept.

**Table 2.2: Classification of shopping Mall in the USA according to ICSC standards**

		Type	Concept	Size (m <sup>2</sup> )
Open-Air Centres		Neighbourhood Centres	Daily needs	3.000-15.000
		Community Centre	General goods, daily needs	10.000-35.000
		Life Centre	Luxury shops, food, entertainment	15.000-50.000
		Power Centres	Big store, few tenants	25.000-60.000
		Themed Centres	For leisure, tourist-targeted	8.000-25.000
		Outlet Centres	Factory outlet	5.000-40.000
Indoor Shopping Centres		Regional	General goods, fashion	40.000-80.000
		Super-Regional Centres	Similar to regional but more variety	80.000<

Source: [www.innovativegis.com](http://www.innovativegis.com)

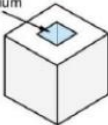

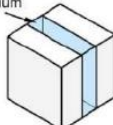
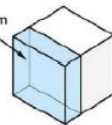
In Turkey, shopping malls initially prioritize their relationship with the physical space they occupy and utilize different plan schemes, including open, semi-open, and closed layouts. These schemes are based on linear arrangements, such as the halter design, as well as center/atrium plans, combination charts, Cartesian layouts, mixed/complex designs, and chaotic layouts. These plans conform to the standards and specifications set by the ICSC in European countries. Additionally, two further classifications have emerged based on the functions of shopping centers. These include shopping-focused centers, centers combining shopping and entertainment, centers combining shopping and living arrangements, centers combining shopping and office spaces (including residences and home offices), and centers with mixed functions. These classifications also consider the specific focus of the users and the products offered. This increased diversification, growth in numbers, and evolving characteristics have contributed to these new classifications.

Shopping centers are categorized based on their connection with the physical setting. They can be classified as either open, semi-open, or closed spaces. Shopping malls, which mainly cater to the daily needs of consumers, are typically found in residential areas, holiday sites, or university areas that are away from the city center and have suitable climate conditions. These malls may have a combination of closed spaces, open or semi-open sheltered areas for circulation, and open and/or closed parking areas. Closed shopping malls, on the other hand, are considered as a single unit, even if they consist of multiple buildings connected to each other. These malls typically offer a variety of functions and provide closed and sheltered spaces, as well as open and/or closed parking areas. Semi-open shopping areas, also referred to as mixed or hybrid centers, include both indoor and outdoor shopping and social spaces, along with open or closed parking areas. According to the ICSC standard, shopping centers with a total construction area of 5,000 m<sup>2</sup> are included in all classifications. (Verdil, A. 2017, Yıldırım, T., 2010).

### 2.5.3 Three Dimensional Charts of Shopping Centres According to ICSC Standards

The paragraph suggests that classification according to ICSC standards allows for different types of store layouts, including Dump-Bell, 3T, Race Track, Parallel Edge, Triangle, Lens, Mixed, and atrium layouts. These layouts are based on the shopping action, and can be shaped and changed based on the environment, space, unit, and circulation. There are also studies that classify atrium plan schemes as closed, open-edged, linear, and adjacent.

**Tablet 2.3: Classification to plan diagram according to atrium design**










CLASSIFICATION TO PLAN DIAGRAM ACCORDING TO ATRIUM DESIGN					
		Closed Atrium	Open Edged Atrium	Linear Atrium	Adjacent Atrium
THREE DIMENSIONAL SCHEME					
		Atrium	Atrium	Atrium	Atrium

Source: www.innovativegis.com

The classification created based on circulation and unit relation, which is different from the ICSC standards, also incorporates linear L-U-T that comes from linear schemes, as well as linear comb and atrium plan schemes (Table 4 by Calgın K.,G., 2017, Verdil, A. 2017, Yıldırım, T., 2010). Furthermore, the placement and layout of entrances, pathways for both patrons and service personnel, retail spaces, communal areas, and gallery spaces, as well as the core and plumbing areas, which may differ in terms of their quantity and standard, become more significant in the planning and arrangement of shopping centers.

### 2.5.4 Shopping Centre Plan

**Table 2.4: Shopping Centre Plan**

CLASSIFYING THE PLAN DIAGRAM ACCORDING TO CIRCULATION AND UNIT RELATIONSHIP						
		Space		Circulation		
		Linear	L and U Plan Scheme)	3T/T Plan Scheme	Complex	
PLAN SCHEME						
		Atrium			Comb	
PLAN SCHEME						

Source: www.innovativegis.com

**2.5.5 Classification According to Function, User and Product Orientation of Shopping Centres.**

In Turkey, shopping centres now serve various purposes beyond just shopping. A new system of categorization has been created based on ICSC standards, which focus on the role of the user and the product. As a result, shopping malls in Turkey are classified into four groups based on their relationship with the physical environment: Shopping-Oriented, Shopping and Entertainment-Oriented, Shopping and Living Centre, and Mixed Functionality. They are also categorized into three groups based on their focus on either the product, the user, or both.

**Table 2.5: Classification According to Function, User and Product Orientation of Shopping Centres**

CLASSIFICATION	FUNCTION	DESCRIBE
ACCORDINGS TO ITS RELATIONSHIP WITH THE PHYSICAL ENVIRONMENT	Shopping-Oriented	They are the traditional shopping malls. Social activity is limited.
	Shopping and Entertainment-Oriented	The main function is shopping and the side function is entertainment.
	Shopping and Living Centre	It has two different functions together.
	Mixed Functionality	It has functions such as housing, business, entertainment, shopping, education, etc.
ACCORDING TO USER AND PRODUCT ORIENTED	Product-Oriented	It serves with variety and brand superiority.
	User-Oriented	According to age, income level and expectation (Outlet, VIP, Child-Amusement Centres).
	User-And-Product-Oriented	They are specialized centres managed from a single centre.

Source: [www.innovativegis.com](http://www.innovativegis.com)

**2.6.0 Market Places in Nigeria**

Markets have existed since ancient times and are a crucial component of Nigerian towns and villages. As an economic institution, markets have a significant impact on the nation's economy. Their importance extends beyond the economic aspect, as they also serve as social entities. Over time, markets have gained a distinct social and cultural value (Vagale, 1974). The economy of Nigeria is still developing, and as a result, small-scale retail businesses play a major role in the economic activities for most people. This means that markets are extremely important and cannot be done without. Currently, the Nigerian government's plan for development is focused on industrializing the rural areas. Developing countries aim to progress in a way that is sustainable, meaning that the development caters to the needs of the present without sacrificing the ability of

future generations to meet their own needs. (Brundland Report, 1987). Accordingly, the previous market areas are now being replaced by organized and well-planned developments, featuring permanent structures in fixed locations. (Uzuegbunam, 1990).

### **2.7.0 Theoretical Frame Work**

Over the past 50 years, shopping formats in the western world have undergone significant changes. Initially, open precincts were popular in the 1950s, but they were later replaced by enclosed shopping centres. However, there has been a recent shift towards more open and natural shopping environments. This change is due to the criticism of enclosed shopping centres, which are seen as isolated and disconnected from the surrounding urban context. As a result, new generation centres in central areas aim to reintegrate the shopping mall and the urban centre. This is achieved by blending the bounded retail buildings into the immediate cityscape, which improves movement and increases densities in shopping areas. Many urban design theorists, including Jane Jacobs and Leon Krier, argue that a thriving urban fabric should be easily accessible and interconnected.

Hillier argues that 'Disurbanism' occurs when the relationship between buildings and public spaces is disrupted, specifically through the disconnect between different levels of movement. This disrupts the connection between residents and strangers. Hillier also states that an integrated movement system within shopping centers not only improves accessibility and permeability, but also subsidizes to the development of city environments that are prosperous both physically and socially. As a result, shopping centers have evolved in recent years to prioritize their interaction with the surrounding urban context in order to achieve commercial and environmental sustainability.

#### **2.7.1 Shopping Mall**

A mall is a multi-floor building that includes attractive window displays, good air circulation, and comfortable places for visitors to do activities. It is filled with various retail shops, both independent vendors and branded stores, all within one structure. The stores are connected by pathways, making it easy for visitors to move from one shop to another. The purpose of these

pathways is to connect the interior and exterior spaces of the building. The layout and structure of the mall are determined by the arrangement of these pathways, which are influenced by the different facilities available, such as stores, anchor tenants, catering services, food courts, and entertainment facilities. Both vertical and horizontal pathways are used to help visitors easily reach the stores and other facilities within the mall.

The corridor, bridge, and atrium are common methods of horizontal movement used in shopping malls. Their primary purpose is to guide and disperse consumers throughout the various areas of the mall, including shops and stores. One type of corridor frequently seen in shopping malls is a single loaded corridor that typically measures at least three meters wide, if not wider. Yuli, A. S. et al, emphasizes in one of their works which provided to ease consumers' circulation so that they are able to enjoy the shop frontages, undisturbed by those who are just passing by. Escalator, lift is a vertical circulation that are commonly used in shopping mall. The presence of escalator and lift is to help visitors to access stores or tenants and also, they can visually direct see the goods that offered.

According to Coleman and Peter, careful planning of circulation space in a shopping mall is crucial for its success. It is important to consider various functional factors, such as accommodating a large number of visitors during busy times. The circulation space not only impacts the functioning of the mall but also contributes to its overall character, which in turn affects visitors' qualitative memories of the place. This aspect is particularly important in an era where creating memorable experiences for customers is highly valued.

### **2.7.2 Circulation System in a Shopping Mall**

Circulation in architecture involves the way people move and engage with a building's environment. It is crucial in public buildings, which are purposely designed and placed to ensure a smooth flow of people and easy access to circulation elements like stairs, hallways, elevators, and parking areas, and so on by Bukola A. and Marvelous O., 2021. The establishment of a free-flowing and favorable shopping atmosphere depends on circulation. It is a vital factor to consider

during the design phase as it facilitates the movement and arrangement of space. The proper selection, planning, and development of a shopping center should be a well-structured and logical procedure that relies on ample and precise information. (Gould, 2015 Adequate circulation should be arranged in a shopping center to ensure its efficiency as numerous customers visit the center for their shopping needs. (Bacham, 2013). He also argues that the fundamental issues regarding the movement of pedestrians within buildings are key factors in shaping architectural design. (Knorr, 2009) The author argues that circulation in a floor plan refers to the paths we take through a building, and these paths greatly influence the success of a design. Additionally, they claim that circulation space should be equally captivating as other parts of a structure.

Circulation in architecture refers to the way different areas of a building are connected, both internally and externally. This can be achieved by creating openings in the building's design. However, not all buildings need separate areas specifically designated for horizontal and vertical circulation.

The circulation pattern is an essential aspect of architectural design that facilitates human activity. It is the movement within a building that allows for a comprehensive experience of architecture in three dimensions and provides a sense of satisfaction within the space. Without movement, architecture becomes static like a stage set, visually appealing but lacking a meaningful connection to the user. (knorr, 2019). To buttress this, (Simond et al, 2019), pointed out that “most constructions have meaning only to human and only as we experience them.

When discussing circulation in architectural design, it refers to the physical elements of a practical design, such as how space is organized, the shape of the building, how people move through it, and how it interacts with the environment (Hunter, 2010).

Many designers overlook the significance of circulation and view it as a hindrance to good design or a problem that can be addressed with signs. However, in public buildings like shopping centers and museums, circulation is extremely important. It is essential to have a floor plan that enables

continuous movement and minimizes the need to backtrack, allowing visitors to view each work in a specific order. Elements such as elevators, escalators, and staircases are often referred to as circulation elements since they are strategically positioned and designed to enhance the flow of people throughout a building (Carpman and Grant, 2022).

Architects, site designers, engineers, interior designers, and building owners and administrators commonly have the responsibility for spatial planning, design of built elements, and circulation system design. Problems with exterior circulation often include difficulties in identifying building entrances and a lack of clear access from parking facilities or public transportation. Interior circulation obstacles commonly include a lack of uniqueness in the layout of a facility, connecting corridors at awkward angles, and inadequate lighting at intersections, entrances to important areas, and landmarks. (Carpman and Grant, 2022).

#### **2.7.2.1 Analyses in store movement and sale patterns**

A method for creating maps of how shoppers move around a store by examining the items they bought. While the idea of movement within a store is alike, the specifics vary due to geographical factors and approach. The analysis changes from considering miles along a road system to measuring feet through the aisles and fixtures. Unlike on the road where fixed widths of pavement and traffic rules exist, shoppers in a store can take unpredictable paths that are not compatible with traditional network analysis. Nonetheless, the goal remains the same for me: to reach the desired location(s). The goal is to quickly acquire the desired goods and return home with ease. The fundamental idea of movement remains the same, but the perception of movement has undergone changes.



Figure 2.1: Establishing Shopper Paths. Stepped accumulation surface analysis is used to model shopper movement based on the items in a shopping cart.

Source: [www.innovativegis.com](http://www.innovativegis.com)

The store's floor plan consists of various barriers scattered throughout, creating a continuous surface. The main aisles represent the main streets, while the overfilled areas resemble secondary streets. The fixtures act as absolute barriers that cannot be climbed over or moved aside while maintaining order. Additionally, there are entry doors, shelves with hard-to-find items, cash registers, and exit doors. The objective is to navigate through this obstacle course and exit without forgetting anything. For retailers, the challenge is to gather as much information as possible about customers' visits. Initially, data analysis absorbed on reordering schedules and descriptive statistics. However, analyzing spatial relationships, such as shopper movement and sales activity within the store, is a recently emerging field. In the provided figure, the left side displays a map of a retail superstore with fixtures and shelving nodes marked. The floor plan was converted to a digital format, and the fixtures and shelves were represented using buildings and addresses found in a city.

This information was then organized on a grid with a resolution of one foot, 1 creating a continuous space for analysis. The right side of the figure shows a possible path a shopper took to gather five items in their shopping cart. This method utilizes a proximity surface, starting from the entry door and spreading out until it reaches the nearest visitation point (one of the items in the cart). The shopper's path is determined by following the steepest downhill path on the truncated proximity surface. This process is repeated to establish the next tier of the surface, spreading from the current item's location until another item is encountered. The path is then adjusted accordingly. The spread and stream procedure continues until all cart items are evaluated, and the final leg of the path leads to the checkout and exit doors.

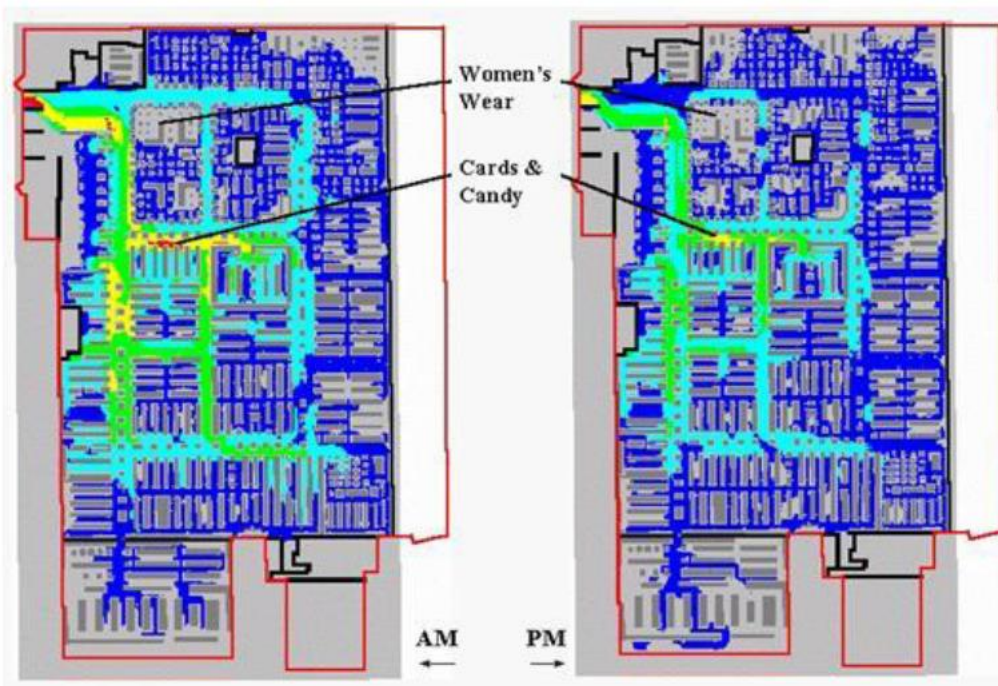


Figure 2.2: Shopper Movement Patterns. The paths for a set of shoppers are aggregated and smoothed to characterize levels of traffic throughout the store.

Source: [www.innovativegis.com](http://www.innovativegis.com)

Additional shopping carts that go through the cash records follow similar routes. These paths are combined and adjusted to create a combined map of shopper movement over a specific time period. While it may not accurately represent individual paths, this map can help identify general traffic

patterns in the store. Shoppers who move randomly or in a zigzag pattern may make the process more challenging, but their presence near their intended purchases is still noted.

In figure 2, the left side displays a combined movement surface for 163 shopping carts in the morning, while the right side shows the surface for 94 carts in the evening on the same day. Cooler colors represent less congestion (blues), whereas warmer colors (yellow and red) indicate higher levels of traffic. It is worth noting that there are similar movement patterns, with the most crowded areas being in the middle-left section of the store during both time periods. The preceding section discussed a method for creating maps of how shoppers move within a store by examining the items they purchase. It compared the analysis of in-store traffic patterns to studying the routes shoppers take from their homes to the store's parking lot, with the parking lot aisles being like streets and the shelving locations being like street addresses. The goal of a shopper is to navigate from the entrance door to the desired items, pass through the cash registers, and exit the store. On the other hand, the objective of the retailer is to present the desired items (and even those that shoppers were not aware they wanted) in a convenient and logical arrangement that ensures sales, (Carpman and Grant, 2022).

Although there are similarities in terms of the concept, there are significant differences between modeling traffic within a store and within a town. One major difference is the importance of the vertical aspect of shelving addresses, which affects how products are presented. Additionally, the options for movement within and around store fixtures are complex and somewhat unpredictable, just like the characterization of sales action. These factors indicate that a surface analysis approach (using raster) is more suitable than the traditional network analysis approach (using vector) when modeling movement within a store and the accident of maps.

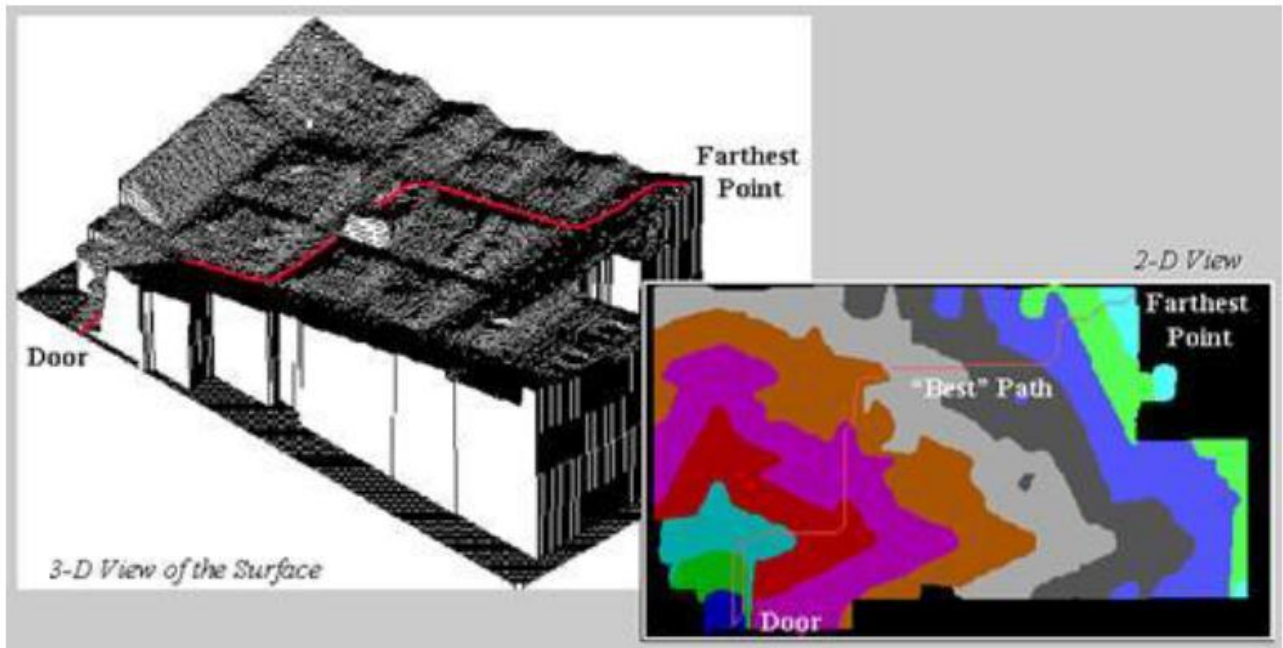


Figure 2.3: A shopper's route is the steepest downhill path over a proximity surface.

Source: [www.innovativegis.com](http://www.innovativegis.com)

Path density analysis creates a surface that accumulates in steps, tracking the path from the entrance door to each item in a shopper's cart. It determines the likely route taken to gather the items by connecting the steepest downward paths along each surface segment.

The third diagram displays a solitary route overlaid on 2-dimensional and 3-dimensional graphs of the nearness surface for an object located at the opposite side of the store. This surface functions as a small staircase, directing the movement from the entrance to the object.

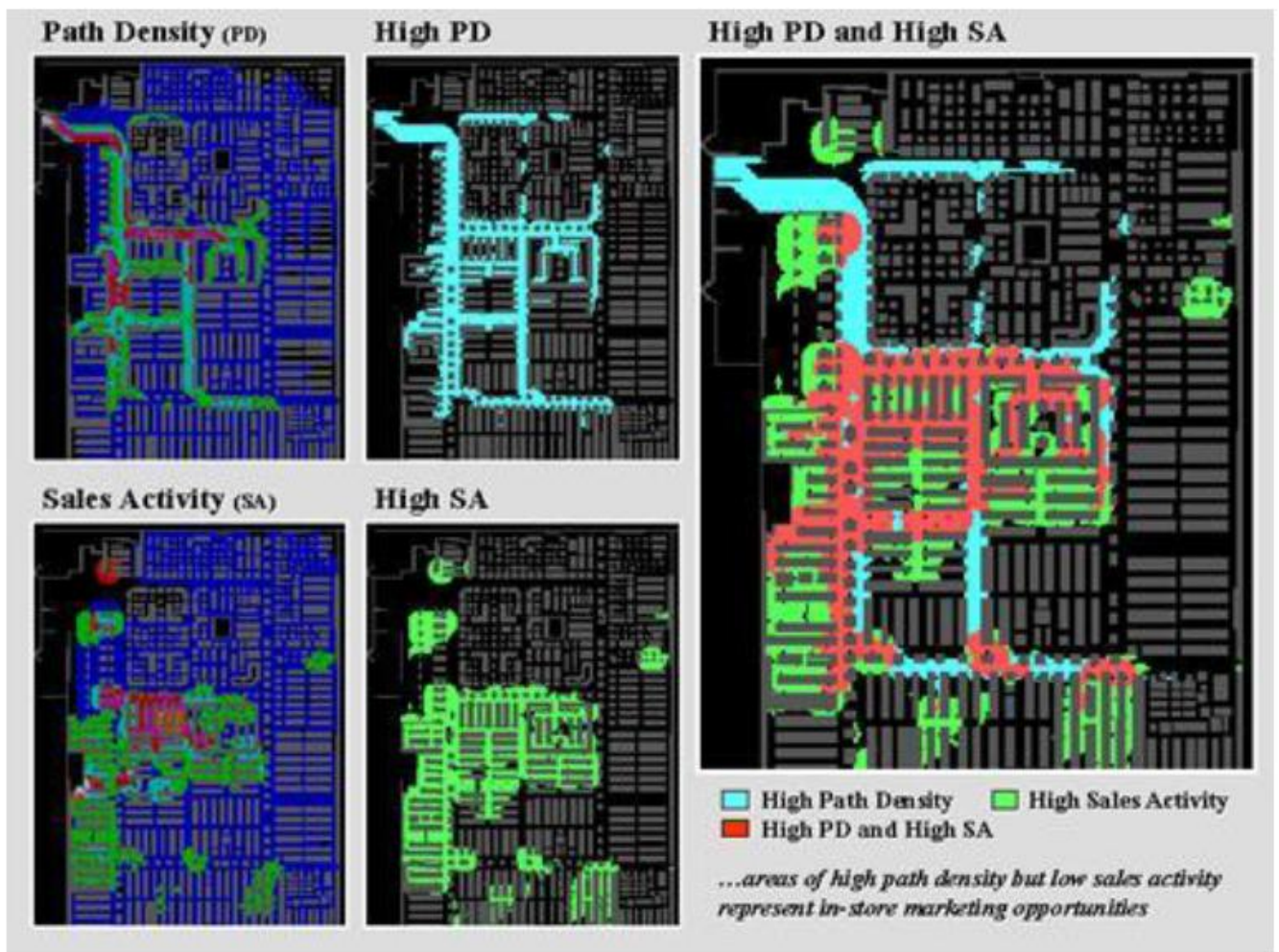


Figure 2.4: Analyzing coincidence between shopper movement/sales activity surfaces.

Source: [www.innovativegis.com](http://www.innovativegis.com)

The process progresses from one item to another and eventually to the checkout and exit. By analyzing the movements of a collection of shoppers over a period of time, such as the morning, a continuous representation of their movement through the store is created, showing the flow of in-store traffic. The top left corner of figure 4 displays the concentration of shopper paths during the morning period previously discussed. The bottom left corner of the figure indicates the sales activity during the same period. This sales map was created by linking the items in shopping carts to their corresponding locations on the shelves and keeping a running tally of the number of items sold at each location. To achieve a smooth representation of sales points, a "roving window" technique was used, where a window moved across the map and the average number of sales within a ten-foot radius of each analysis grid cell (1 square foot) was calculated. The resulting

representation provides insight into the items being checked out, giving a space-time representation of in-store sales activity. The maps in the center identify areas with high concentrations of shopper paths and high sales activity by highlighting areas that exceed the average for each mapped variable.

When looking at the maps, pay attention to the similarities and differences. Both show concentration on the left and center parts of the store, but there are also some outliers, such as a pocket of high sales on the right edge and a strip of high traffic along the top aisle. However, it is difficult to make a detailed comparison by simply glancing back and forth because the human brain is not adept at summarizing spatially specific data. The enlarged inset on the right combines the two maps and highlights the areas where action is minimal (low traffic and low sales) in darker tones. The orange pattern indicates areas with high path density and high sales activity, which is what the retailer hopes for. The green areas are somewhat perplexing as they have high sales despite low traffic. This suggests that only a specific group of shoppers who have a purpose shop in these areas, even though it may be inconvenient. However, the light blue areas, which have high shopper traffic but low sales, present the real potential for opportunity. However, the strip located in the lower center of the store appears to serve as a convenient pathway connecting the upper and lower areas. The retailer could potentially consider placing some end-cap displays along this pathway to entice customers with impulse or sale items, although this decision should not be made hastily based on a limited analysis of a few thousand shopping carts over a couple of days. This approach allows retailers to gather valuable insights into the shopping habits and patterns of their customers without being intrusive or incurring excessive expenses for data collection. The raster data structure of this method also enables an examination of the relationships within and between the mapped data. For instance, studying differences in shopper movement between two time periods involves simply subtracting the two maps. If a percentage change map is required, the difference map can be divided by the initial map and then multiplied by 100.

To identify areas with sales that have increased by more than 50%, the percent change map is utilized. This map allows us to isolate these specific areas, and then the values for the corresponding cells on the sales activity map are averaged. In this approach, each map is seen as a variable defined in space, with each grid cell functioning like a sample plot, and every value in a cell representing a measurement. These maps hold valuable information that is just waiting to be uncovered. The initial part of this series explained a method for estimating shoppers' movements within a store by analyzing the items present in their shopping carts.

The second section of the discussion expanded on the analysis of checkout data to include mapping sales activity. It also introduced specific procedures to examine the spatial connections between sales and movement.

Remember that the raster data structure, which consists of 1-foot grids, made the analysis easier because it created a consistent division of geographic space. In a mathematical understanding of maps, each value within a grid cell represents a measurement, the cell itself is similar to a sample plot, and each gridded map represents a variable with a spatial definition.

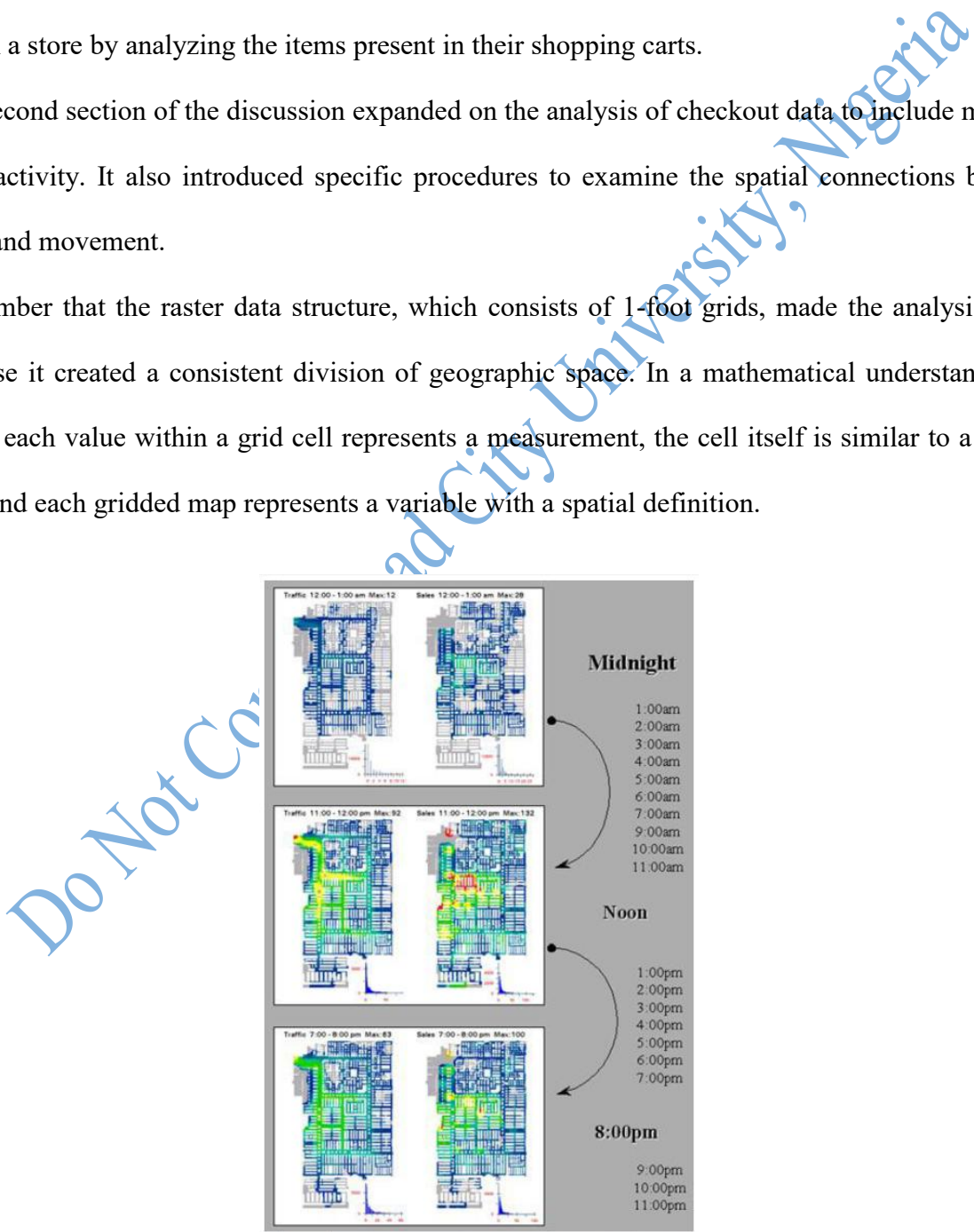


Figure 2.5: Snapshots from a movie of hourly maps of shopper movement and sales activity. Source: [www.innovativegis.com](http://www.innovativegis.com)

The understanding that maps are not only pictures but also contain valuable data drives the approach of "data mining." By combining cognitive interpretations of data with physical landmarks for geographical context, new and valuable perspectives of spatial relationships can be gained from a dataset. As shown in figure 5, the insets depict three snapshots of an animated representation of shopper movement and sales activity. The checkout data, divided into hourly segments, was used to generate normalized movement and sales surfaces, which were then assigned a consistent color scheme for visualization. When observed in motion, the warmer colors indicate higher activity, resembling wisps of fog moving under the Golden Gate Bridge. The similarities and differences in movement provide an impressive display of the spatial and temporal relationships contained within the data. Techniques like animation and 3-D datascapes transform complex tables of numbers into pictures that are easier for humans to understand. However, while the human brain is skilled in many areas, it struggles with detailed analysis of mapped data. By visualizing the hourly changes, a general understanding of the timing and patterns in shopper movement and sales activity can be gained. Yet, further insights are obtained by identifying locations of "significant" differences at each time step. This is done by finding the difference between two surfaces (such as movement at 1 am), finding the average and variability of the difference, and then emphasizing areas that deviate more than one standard deviation from the average. When displayed as an animation, the movement of these change throughout the store provides a different view of the checkout data.

Segmenting a dataset is a fundamental aspect of numerous data mining procedures. Besides time, the data can be categorized based on spatial partitioning. One approach is to condense each department's "footprint" into a yield index, representing the ratio of average sales to average movement. By calculating this on an hourly basis, it becomes possible to determine which departments are performing the best at different time intervals. Alternatively, data can be segmented based on its characteristics. For instance, traditional product affinity analysis, which identifies items frequently purchased together, can be expanded to include spatial implications.

Common sense dictates that items with a high product affinity, such as shampoo and conditioner, are likely to have a high spatial affinity, meaning they are placed close together on store shelves.

Proximity analysis is utilized to calculate the distance between items, which is then adjusted and compared to the affinity index of the pair's product. Differences reveal poorly arranged items, such as similar products placed far apart or dissimilar products positioned close together. This affinity data also helps in optimizing the arrangement of impulse and sales items for frequently altered action aisles and end-cap displays.

Figure 6 illustrates a segmentation analysis of data characteristics. The map in the top left corner gives a summary of all the paths taken by shoppers who bought items from Department 5 (Electronics, marked by a dotted rectangle). It can be observed that most of the paths are concentrated around the Electronics Department, suggesting that buyers of these items did not explore other departments. On the other hand, the inset in the bottom left corner displays a similar map for Department 3 (Card & Candy). It is noticeable that there are more paths and they are spread out further compared to Department 5.

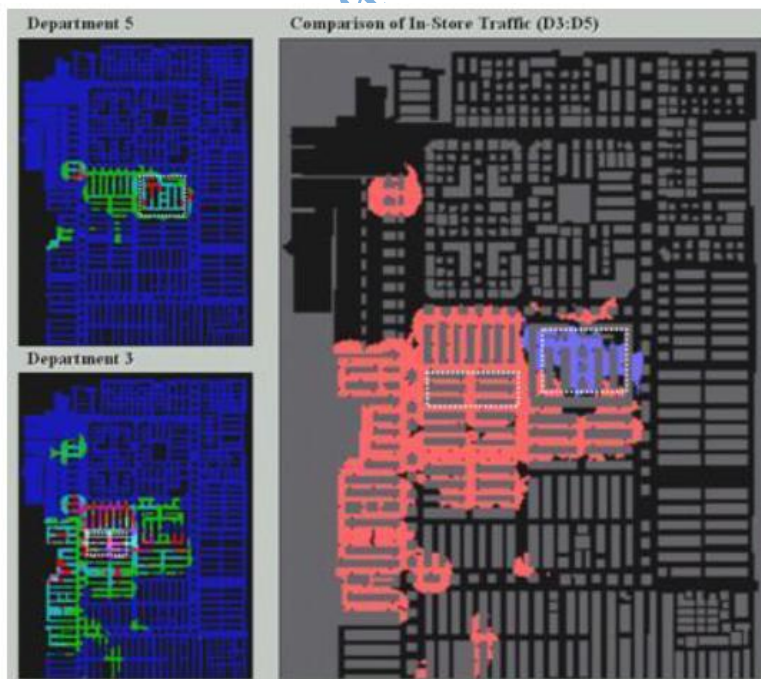


Figure 2.6: Departmental comparison of shopper movement patterns.  
Source: [www.innovativegis.com](http://www.innovativegis.com)

The map on the right-side displays regions with significant variations in the number of paths taken by Shopping Carts carrying items from Departments 3 (orange) and 5 (blue). It is anticipated that there will be noticeable differences in the areas designated for each department. Surprisingly, the blue areas at the top indicate that more shoppers who bought electronics traveled to the men's wear section compared to those who purchased cards and candy. This observation, which is supported by empirical evidence and common sense, raises curiosity about the potential insights that could be gained from analyzing the orange area (with more traffic for cards and candy) or comparing other departments.

### **2.7.3 Vehicular Movement and Traffic in the Shopping Centre**

The location of a car park is extremely important unless it offers free or discounted parking. If the location is inconvenient, it could greatly impact the success of the car park within a shopping center. Even a difference of just one city block could lead to a loss of customers and potential failure of the car park. The level of occupancy and income generated from a car park depends on its location, its proximity to the places it serves, other popular destinations, the road network, and the convenience of parking within the facility itself. A car park should be within walking distance of main destinations, as people are willing to walk additional if parking is free. Ideally, the car park entrance should not be hidden or placed on secondary streets. If it is hidden, there should be clear signage and information about available parking spaces, so that unnecessary traffic circulation can be minimized and alternative parking options can be directed to if necessary.

However, in smaller cities or shopping areas outside the city, where people are generally more familiar with parking locations, the entrances to parking lots might be found on side streets instead. As mentioned earlier, it is important for parking entrances to be clearly marked and easily distinguishable from exits. It is also important to pay attention to the architectural design of entrances, as a visually appealing and welcoming entrance can contribute to a successful parking experience. The number of entrances and exits should only be as many as necessary. Generally, the number of lanes for entering and exiting is determined by how many vehicles can be processed in

one hour. Having more access points than necessary may not actually help with traffic issues and could even create problems inside the parking lot. Whenever possible, both entrances and exits should be designed to facilitate left-hand turns for incoming and outgoing traffic.

The planning of the site's vehicular access should include ensuring convenient parking, efficient vehicle flow, and avoiding conflicts with pedestrians. Additionally, efforts should be made to minimize the negative effects of driveways and ramps on the building's frontage, while ensuring that traffic is evenly distributed onto surrounding streets.

### **2.7.3.1 Queuing Areas, Intake and Discharge Capacity**

The competence of a car park's design and operation relies on having sufficient entrance and exit capacities. These capacities depend on factors such as expected traffic flow, queuing space at the entrance, speed of control equipment, and the ability of the street to handle outgoing traffic. It is important to have enough queuing space at the entrance to prevent congestion on nearby streets and within the car park. Similarly, a queue length should be provided at the exit to accommodate cars waiting to join traffic and allow drivers to exit quickly when the boom gate opens. This also helps prevent congestion and delays when pedestrians are crossing the driveway. The length of the queue on exiting should be determined based on traffic engineering analysis, similar to a T-junction intersection. Ideally, car parks should be able to handle their full capacity within one hour, but this is often not possible. Therefore, car parks are designed to handle the expected peak inflows and outflows within one hour, based on traffic impact studies. Special event car parks, which experience a surge in demand, should be able to empty in less than one hour, with a discharge capacity as short as 30 minutes

### **2.7.3.2 Levels of service**

The ability of different areas in a car park to handle traffic, known as their dynamic capacity, can be assessed to evaluate their performance. Dynamic capacity refers to the maximum number of cars or people that can be processed through a specific area in an hour. Similar to the concept used

in traffic engineering for roads, the level of service is used to analyze the dynamic capacities of car parks. It describes the operational conditions within a traffic stream and how drivers and passengers perceive them. For example, in some countries, parking space dimensions are determined based on a level of service range of "C" to "D," which is considered sufficient for low turnover operations. Other parking consultants define levels of service as High Level of Service, Satisfactory Level of Service, and Unsatisfactory Level of Service, depending on whether traffic flows are below, equal to, or exceed the dynamic capacity. Determining dynamic capacities is crucial in understanding the level of service. Formulas that consider variables such as aisle width, space dimensions, and the percentage of cars reversing into spaces are used to express the dynamic capacities of aisles and parking areas. An example of an underground multi-level car park for 2500 cars is provided, where the dynamic capacity of the main circulation aisle was calculated as 1100 cars inbound and 900 cars outbound. To handle peak traffic flow, two circuits of express vertical travel were implemented near the entry and exit control points, resulting in a high level of service. Dynamic capacity also applies to entries and exits.

Entrances and exits in car parks, which have boom gates, function similar to intersections with traffic signals where only one vehicle is allowed to pass during each green cycle. When analyzing the capacity of traffic flow in standard traffic engineering procedures, the flow rate is typically measured in 15-minute intervals, although 30 minutes or one hour may also be used. In the context of car parking, the highest flow rate in a 15-minute interval is converted into an hourly equivalent, which is then used to determine the dynamic capacity of individual entrances, exits, or the internal circulation system within the car park. For example, a peak flow rate of 680 cars per hour would be considered equivalent to a peak flow rate of 800 cars per hour. This indicates that having two entry lanes with automated control, each capable of servicing 400 cars per hour, would be sufficient during the busiest 15 minutes and excellent during other times. It is crucial to determine the length of the line inside the parking area to prevent cars from waiting on the street. Queuing theory, which

uses complex equations based on the Poisson distribution of vehicle arrivals for both single and multi-lane queues, can be used to predict potential queues.

### **2.7.3.3 Internal Traffic Circulation**

Having a clear and efficient traffic flow pattern is essential in good design, both inside and outside of buildings. While large shopping center parking lots prioritize allowing users to park anywhere, multi-level parking structures need more organized and controlled traffic circulation.

The type of patronage and turnover of the car park can dictate the ideal traffic circulation system, with one-way flow being suitable for high turnover car parks and two-way flow being considered for commuter car parks. However, in multi-level car parks, it is recommended to have one-way traffic circulation with a repetitive floor pattern to avoid congestion and collisions. The preferred direction of circulation on ramp systems is generally clockwise, as it allows for better vehicle handling. However, in cases where the car park has a large floor area and multiple aisles, the parking layout often dictates the flow of traffic, with no clear advantage for clockwise or anticlockwise circulation. In some cases, using anticlockwise circulation along perimeter aisles can eliminate traffic crossings.

### **2.7.3.4 Psychological Factors**

When a driver drives into a car park that has columns along the edges of the parking area, it gives the illusion of a wider and more spacious parking space and makes the driver feel like they have more freedom to move around. This type of column layout has a positive impact on the driver's psychological state and is considered user-friendly. However, there are also psychological factors that can negatively affect drivers in car parks, but these can be minimized or avoided with some careful design planning. For example, long and narrow enclosed corridors can make drivers feel

anxious and claustrophobic, similar to driving in a tunnel. To prevent this, ramps should be open with good lighting and visibility. Another psychological factor is the feeling of uncertainty and distraction when driving on long, narrow suspended corridors, often referred to as a bridge effect. One way to reduce this is by installing parapet walls along the sides of long ramps to minimize distractions from the empty space outside the structure.

**Spiral effect:** When numerous upheavals occur within a confined region. Notes:

(a) It is widely agreed that a circular ramp should have a maximum of approximately six revolutions.

(b) It is universally acknowledged that the car park's vertical movement should be limited to a maximum of six loops, whether ascending or descending, through the floors.

**Column effect:** The excessive use of columns in a car park can give a sense of visual pollution, campiness, and limited space, which can pose safety and security risks as well as make maneuvering more challenging. Drivers may feel a sense of claustrophobia in such spaces.

**Roller-coaster effect** – There is a lack of consistent slope on ramps or inclined floors, especially noticeable on ramps that connect floors with a repetitive pattern.

#### **2.7.3.5 Car Park Signage and Line Marking**

Vertical signs and floor/pavement markings are essential for regulating parking and traffic in car parks. The significance of signage rises as the parking facility becomes more intricate. Bigger shopping center parking lots necessitate a greater number of signs compared to smaller ones. Nevertheless, parking and traffic management cannot operate effectively without proper signage. Signage has greatly enhanced in recent times due to technological and quality advancements. The growing environmental and energy conservation awareness has led to an increased use of dynamic guidance systems in and around parking facilities. Dynamic signs can reduce travel distance, eliminate unnecessary circulation of traffic, save travel time, reduce fuel consumption, and

decrease air pollution. External route guidance sign systems are becoming an integral part of street networks and will continue to play a significant role in the future. Regarding parking, these systems guide drivers to parking lots near or at their desired destination.

The success of public car parks, especially in terms of their effectiveness and usefulness, heavily relies on the external signs displayed in these areas. These signs, particularly those found in public car parks, are crucial for attracting the attention of people who are not familiar with the facility. Just like car parks can be described by their static and dynamic features, car park signs can be divided into two categories: static signs that provide basic information through paint or illumination, and dynamic signs that direct drivers to available parking spaces. Dynamic signs utilize advanced technology like inductive loop coils detectors or overhead ceiling mounted ultrasonic directional sensors. Ultrasonic sensors are increasingly replacing inductive loops due to their ability to accurately count vehicles and identify non-vehicle objects. These sensors count the number of cars entering and exiting specific areas and transmit this information to counters or a central processing unit (CPU) that is programmed with the capacity of a particular area. The counters or CPU then activate the appropriate dynamic sign based on the information they receive.

#### **2.7.3.6 Aesthetics and Car Park Usefulness**

Consideration of aesthetics in car parking planning is becoming increasingly important, but there is ongoing debate about its value. One concern is that meeting environmental standards can be burdensome, and a focus on aesthetics may negatively impact the financial feasibility of parking projects. Many architects fail to realize that customers prioritize functional design over a visually appealing facade. Ultimately, car parks are built for the purpose of parking cars, so an attractive exterior cannot make up for an unfriendly internal layout. It is the responsibility of architects and parking consultants to find a balance between aesthetics and usability. An efficiently functional, well-lit, and clean interior is just as vital as an attractive exterior. Additionally, car parks must be accessible to individuals with different abilities. Requirements include:

- 1) Surfaces that are smooth and hard are preferred, while surfaces that are not bound, such as gravel, are not suitable.
- 2) Disabled parking bays must comply with minimum standards and at least 5% of all parking bays should be reserved for disabled visitors. These bays must be clearly marked on the surface and with a vertical sign next to them.
- 3) Lighting should be designed in a way that avoids creating areas of both bright light and darkness.
- 4) Pedestrian routes from the car park to the building should be safe and have lowered kerbs.
- 5) There should be a drop-off area near the main entrance that is long enough to accommodate loading and unloading.
- 6) There should be specific areas designated for coaches to drop off passengers.

Furthermore, it is necessary for vehicles to have access to the structure for various reasons such as making deliveries, performing maintenance, and responding to emergencies. It is crucial to have a designated area adjacent to the appropriate entrance to accommodate these needs. When organizing the parking area, it is important to consider more than just the surface and the cars themselves. It is vital to consider the aesthetic effect it will have, which is often more significant than that of the actual facility. It is advised to incorporate elements such as greenery, shaded areas created by trees, and safe pathways for pedestrians to navigate across and around the parking space. It is important to ensure that the parking design is aligned with and improves the overall appearance of the building.

## **2.8.0 Problems of an unintended circulation and its Facilities of Public Space-Buildings**

### **2.8.1 Unintended Circulation**

According to Ikenna et al., 2021, If the circulation of humans within a building is not sufficiently organized, it can cause disorder and pose a risk to lives, particularly when there is conflict between human and vehicular movement. The author believes that the proper resolution of this issue is crucial as it impacts the smooth functioning of the center. One of the main challenges in a shopping

center is establishing an effective and orderly circulation pattern for both humans and vehicles, as well as implementing security measures. However, in Nigeria, most existing shopping centers suffer from circulation problems. The current circulation pattern lacks order and clarity, with insufficient emphasis on transition points, conflicting human and vehicular movement, absence of designated parking spaces, undefined loading and unloading areas, and overall lack of proper zoning. These deficiencies are believed to be a result of poor circulation planning measures within shopping centers, which hinder their efficiency and fail to provide the desired convenience.

### **2.8.2.0 Circulation Facilities**

Circulation facilities in public space buildings refer to the layout and design elements that are used to accommodate movement between different floors. In malls, horizontal circulation facilities can be flat corridors or bridges that use different materials. Vertical circulation facilities can include stairs, ramps, lifts, escalators, and more. In malls, these circulation facilities can also be integrated into the building structure and contribute to the aesthetic elements of the space.

All visitors to public buildings, including malls, must use circulation facilities. This requirement is due to the fact that malls are public spaces containing various commercial, social, recreational, and religious activities. Therefore, anyone is welcome to visit the mall for any kind of activity.

The buildings and public spaces that we encounter serve as mediums to accommodate various activities for the general public. However, the implementation of inclusive and universal physical space facilities, which can be utilized by all visitors, is not widely practiced in Indonesia. Many of the building designs currently used do not consider the needs of individuals with physical limitations, different age groups, or the differences between genders. This lack of consideration is often attributed to the perception that implementing inclusive design is costly, which hinders efforts to promote and develop universal design. Nevertheless, applying universal design can indirectly benefit all users, regardless of their physical abilities, and enhance productivity, even as individuals age or experience physical changes. In addition to legislation and public awareness, accessibility for individuals with special needs is not a focus for designers. Even though

construction guidelines emphasize the importance of universally accessible design, design schools do not typically teach universal design concepts and methods. The heads and managers of design programs often lack awareness, sensitivity, information, and skills related to disability issues and accessible design. This also extends to a lack of understanding about entrance and circulation facilities in public spaces with a universal design approach.

#### **2.8.2.1 Horizontal Circulation**

Elements such as corridors, verandas, and porches are considered part of horizontal circulation elements. These elements play a vital role in facilitating uninterrupted movement throughout a building and creating seamless transitions between different levels. According to Beirne (2003), horizontal circulation refers to the walkways on various floors of a structure that allow access to different spaces, including hallways, terraces, patios, entrance lobbies, and overhangs (Elottol, 2011). This study will focus on analyzing specific horizontal circulation elements, namely the car park area, footpaths, central entrances, entrance foyer, and corridors, which have been grouped according to their dimensions and types.

#### **2.8.2.2 Vertical Circulation**

Vertical Circulation facilitates vertical movement between different floors within a building, with the goal of providing unobstructed access to everyone in an equitable manner. According to Beirne (2003), Vertical Circulation comprises various walking and mechanical systems installed on different floors of a building to assist vertical movement, such as stairs, ramps, lifts, and escalators (Elottol, 2011). This research will analyze the following components of Vertical Circulation: Stairs and steps, Ramps, Elevators, and Escalators.

This study focuses on the evaluation of circulation within a building. Previous studies have classified circulation into two categories - "interior circulation" and "exterior circulation". Urban planners and landscape architects are concerned with the evaluation of exterior circulation, while interior designers and architects assess the other. The main focus of this study is to examine the circulation elements from the outside of the building to the inside, specifically considering

circulation within interior spaces and the relationship between the interior and exterior areas in terms of circulation.

The observation guide for accessibility is based on various structured accessibility standards. The most suitable standard for a shopping mall was chosen in order to achieve the desired outcome. All the buildings assessed using these accessibility standards met the necessary requirements for circulation in shopping malls.

### 2..9.0 Lighting

Lighting is necessary in car parks, footpaths, and floodlighting pitches. It is important to prevent light pollution to benefit local residents and wildlife, especially in areas near nature reserves and valuable wildlife habitats. The use of sodium (yellow) light should be avoided. When choosing light fixtures, it is important to direct the light towards the intended area and avoid flooding residential or nature conservation areas with excessive light. Planting trees and foliage can help reduce the glare caused by large paved areas. Lighting is crucial for both security and safety purposes. It is better to have a consistent and low level of light rather than concentrated areas of intense light that create shadows. Plate 1 showcases light fixtures that are environmentally-friendly and can be chosen to prevent pollution.



Figure 2.7: Choose light fittings to avoid light pollution.  
Source: Unified Facilities Criteria. (2004).

*Do Not Copy, Lead City University, Nigeria*

## **Chapter Three**

### **Research Design**

#### **3.1 Methodology**

This chapter looks into different methods used for data collection. These methods apply for sourcing

out data includes field observation and survey, interview, relevant literatures and case studies.

#### **3.2 Data Analysis**

The research methodology and methods of data collection in conducting project is qualitative analysis

of case studies and review of some relevant literature from documented works as published and unpublished literature as started above.

#### **3.3 Data Collection**

**Primary Data:** Primary data was obtained through physical observations, photography and interviews.

**Secondary Data:** Desk-based research was carried out to summarize the key principles that apply to sustainability in academic buildings by reviewing existing literatures. These principles were considered to guide sustainable design of academic buildings globally. These include the review of documented literature from peer reviewed journals, thesis, reports form, agencies, and other information downloaded from the internet.

#### **3.4 Instruments of Data Collection**

The instruments of data collection are the tools that assist in carrying out the research, for assessment of the variables used in the research. The instruments of data collection applied in this project is listed below;

- Spatial Analysis Schedule
- Sketches
- Notes

- Photographs

### **1. Spatial Analysis of Case Studies**

Physical survey is being used to obtain basic information about the proposed site. It was used to acquire

a good knowledge about the site context. The technique used to achieve this purpose was personal observation.

### **2. Literature Review**

A good understanding of the building type was acquired through the use of past literature which include

books, past projects on the building type, journals that were considered resourceful to the design of the

proposed facility and information on the building type as acquired from available literature.

### **3. Interview**

The end user's management staffs which include students of some institutions visited were interviewed

on their perceptions about existing faculty buildings.

#### **3.4.1 Case Studies Analysis**

Information useful for the design of the proposed facility were acquired through the use of case studies.

Through the case study, historical information is gotten by looking at the issue as a whole before considering them in isolation. Through this process a comprehensive knowledge of the subject matter

we deduced and the concept supporting the school of thought.

In order to fully understand the principle behind designing any building typology, an initial assessment

of the existing building typology would have to be done. The initial assessment will be in term of

spatial, functional, equipment and operational efficiencies and standards.

### **3.5. Case Study One: Tinapa, Shopping Centre,**

#### **3.5.1 Property Description**

The shopping complex is situated in Calabar, Cross River State, Nigeria and was established in 2006. It was developed by GAPP, Architects & Urban Designers, Africa and is currently managed by the Gendel Group. The client for this project is the Cross-River State Government. There are four emporiums serving as anchor tenants within the complex. The retail floor area spans 80,000m<sup>2</sup>, accommodating both retail and wholesale businesses. Additionally, there are 3000 public parking spaces available, as well as designated truck and service parking areas.



Plate 1: Perspective view of Tinapa massive shopping center Calabar  
Source: www.tinapa.com



Figure 3.1: Plan showing the site plan of Tinapa Business Resort, Calabar, Cross River State, Nigeria  
Source: www.tinapa.com

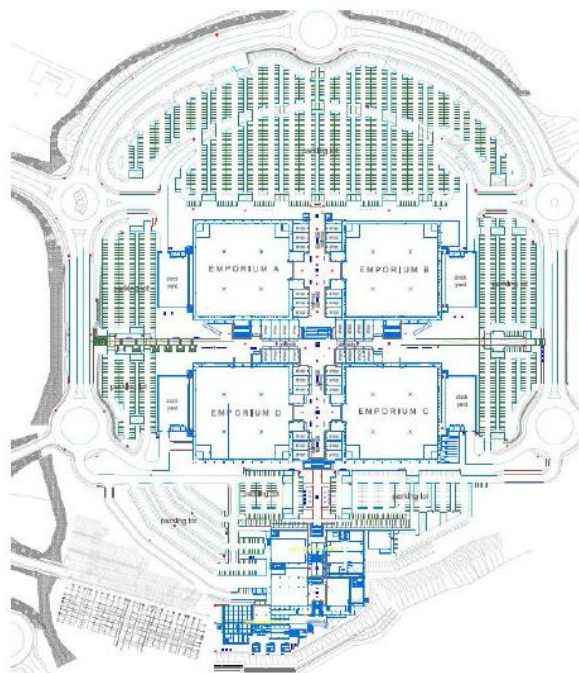


Figure 3.2: Plan showing the emporiums, the entertainment area and the parking spaces, of Tinapa Business Resort, Calabar, Cross River State, Nigeria  
Source: www.tinapa.com

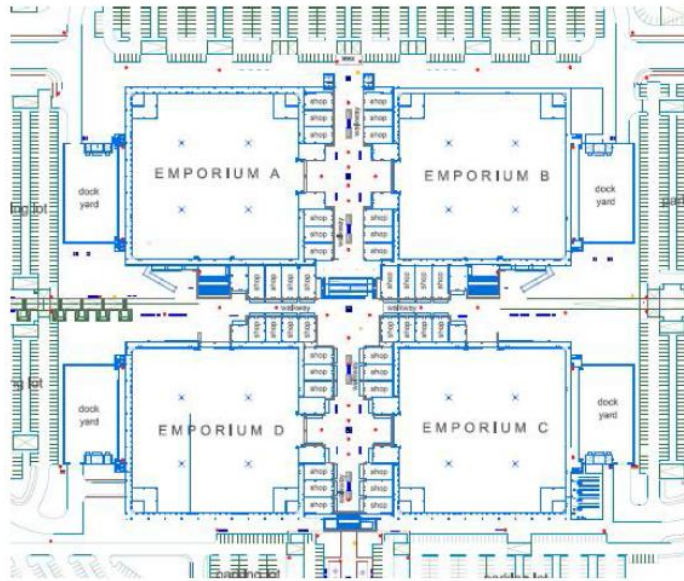


Figure 3.3: Plan showing the emporiums, the entertainment area and the parking spaces, of Tinapa Business Resort, Calabar, Cross River State, Nigeria  
Source: www.tinapa.com

Emporium A offers various amenities such as supermarkets, fish markets, fruit and vegetable stands, banks, travel agents, bookstores, pharmacies, tobacconists, cell phone stores, specialty shops (such as photographic and car rental services), dry cleaners, optometrists, and courier services.

Emporium B provides appliances, electronics, furniture, bedding and mattresses, specialty audio equipment, art and farming supplies, computers, leather and luggage items, coffee shops, lighting fixtures, a tile showroom, and home accessories.

Emporium C showcases vehicles, outdoor equipment, lifestyle products, hardware, motor accessories, sports goods, linen and fabric, toys, specialty items, stationery, office equipment, telephone shops, internet cafes, and books and music stores.

Emporium D specializes in textiles and fashion, with offerings such as ladies and gents shoes, hairdresser services, branded fashion items, specialist fashion products, sports goods, coffee shops, children's clothing, fashion accessories, cosmetics, and jewelry.



Plate 2: Picture showing the retail shops along the walkway, Tinapa Business Resort, Calabar, Cross River State, Nigeria

Source: [www.tinapa.com](http://www.tinapa.com)



Plate 3: Picture showing the retail shops along the walkway, Tinapa Business Resort Calabar, Cross River State, Nigeria.

Source: [www.tinapa.com](http://www.tinapa.com)

### 3.5.2 General Appraisal

Tinapa business resort, located in Calabar, Nigeria, is a highly esteemed business establishment that was inaugurated in 2006. This event was met with immense enthusiasm and anticipation. The developers of the resort enlisted the expertise of GAPP, an internationally renowned design firm, along with their Nigerian representative COGEDS, to oversee the project from its inception to its current status.

The Tinapa business resort is a new and ambitious project in Cross River State's trade and leisure strategy. It is located in the Calabar trade zone and aims to attract both traders and tourists. Calabar is a city in southern Nigeria, close to the oil producing states of Port Harcourt, Delta, Eket, and Bayelsa, among others. Research shows that Calabar has a population of about 400,000 residents, with an additional 40,000 students.

Maintaining the large emporiums is challenging and they lack an effective security system. The hall has a high ceiling with exposed roof trusses, which is visually unappealing as all the pipes and fittings are visible. The roof is made of aluminium sheets, which allows heat transmission through radiation, and the hall remains open to the roof. The interior space relies solely on artificial lighting with little to no provision for natural lighting.

The epoxy floor finish, which is costly, has been applied to the floor. If the floor needs to be divided into separate spaces for rent, it will need to be altered accordingly. The extent of this alteration will depend on the type of partitioning chosen. If permanent partitions are installed, the floor will be impacted, whereas using movable partitions will present safety concerns.

The emporium is a spacious area that has separate sections that can be rented out. The height of the emporium is more than 6 meters from the finished floor level. There are a total of four wholesale emporiums in this development. These emporiums are accompanied by a diverse selection of bookstores, specialized CD and DVD stores, pharmacies, beauty salons, banks, and jewelry stores. Adjacent to the shopping district lies a recreational compound consisting of hotels and a waterfront

expansion known as the Fisherman's Wharf. Moreover, the site boasts movie theaters, a dining court, an internet café, a gaming center, and a parking lot accommodating 3000 automobiles, in addition to extra parking spaces for trucks and other services.

- Tinapa strives to be a business resort and has implemented facilities that are specifically designed for their intended purposes. For example, a central air conditioning system is used to regulate the temperature within the emporiums.
- The market hall/emporium creates a bustling atmosphere, which is typical in a shopping center.
- The service/dock yards are strategically located away from the main emporium area, using dwarf wall partitioning and landscape screens. Proper management and control of waste is implemented.
- The design and zoning of Tinapa aligns with the tropical climate of its location.
- The parking space, which exceeds 3000, adequately accommodates the influx of visitors, considering the scale of the project and the city of Calabar.



Plate 4: The shopping emporium interior with roof open to hall showing service pipes, floor finished with epoxy which is expensive, Tinapa Business Resort Calabar, Cross River State, Nigeria.  
Source: [www.tinapa.com](http://www.tinapa.com)



Plate 5: Picture showing the retail shops along the walkway, Tinapa Business Resort, Calabar, Cross River State, Nigeria  
Source: [www.tinapa.com](http://www.tinapa.com)



Plate 6: Exterior perspective view of Tinapa Business Resort, Calabar, Cross River State, Nigeria.  
Source: [www.tinapa.com](http://www.tinapa.com)

### 3.5.3 Appraisal: Entrance Observation

- The Entrance is easily seen and stands out.
- The design of the Entrance is accessible to all.
- There is sufficient space both inside and outside of the entrance doors.
- The threshold to the entrances is flat or no higher than 10mm and has a sloping edge.
- There is a covered area or recessed door to protect against weather.

- All the retail shops along the walkway, their entrance is also clearly design visible for shoppers to patronize their goods and services.

#### **3.5.4 Appraisal: Horizontal circulation**

The layout is organized and straightforward. The paths through the open-plan area are clearly marked. There are seats placed regularly along the walkways. The corridor is wide enough, with a minimum clearance of 3000mm. The horizontal elements of circulation aid in maintaining continuous movement throughout the building and allow for easy transitions between different sections.

#### **3.5.5 Appraisal: Vertical circulation**

- Sign showing the use of a lift or other vertical circulation measures is at the entrance of the building
- Whatever circulation method is used, alternative area stairs are provided
- An unobstructed manoeuvring space of 3000mm x 3000mm in front of any circulation measure
- Landing and call buttons located between 900mm x 1100mm from the landing
- A handrail be provided on at least one side of the equipment

#### **3.5.6 Appraisal: Parking Area**

The designated accessible car parking includes spacious parking spaces for at least 500 cars, with convenient access to the footpath. It is located close to all entrances and exits, and is clearly marked with parking signs.

#### **3.6.0 Case Study 2: Ceddi Plaza**

- Name: Ceddi Plaza
- Location: 264, Tafawa Balewa Way, Central Business District, Abuja, Nigeria
- Owners: Ceddi Corporation Management: Broll Property services Size: 10,000 Sqm Started: 2001 Opened: November 2005

### 3.6.1 Appraisal

Ceddi Plaza is a well-liked shopping and entertainment center situated in the Central Business Area of Abuja. It is owned by Ceddi Corporation and comprises of 55 specialty shops, offices, and service providers. These offerings include movie theaters, a bookstore, a champagne lounge, restaurants, cafes, fashion boutiques, home interior design stores, health and beauty salons, gift shops, banking and ATMs, dry cleaning services, a dental office, a pharmacy, a photo studio, children's entertainment, and an events hall. The Plaza encompasses 10,000 square meters of retail and office space, with three floors dedicated to retail and three floors dedicated to corporate office space. It was opened in November 2005 and is managed by Broll Property Services Nigeria. Ceddi Plaza is highly regarded as the premier shopping and entertainment center in Abuja.

Entertainment profile:

There are three eateries available: Kilimanjaro, Bon ice, and Shujuiced. Additionally, there are fourteen fashion accessories options such as Pierre Cardin, Wrangler, and Nike, among others. For entertainment, there are three options: Orpheus Music, Aristotle Bar n lounge, and Silver bird Cinemas. There are also three options for furniture and household items: Bedmate, Svengali, and Picol. For health and beauty, there are four options including Ikani Salon and GNC Live well. Spar Supermarket is the only option for grocery shopping. Four options are available for electronics and phones: Etisalat, Globacom, Cyni Traders, and Gadget Place. Jemi Gifts, Toys and Things, Newton and David, and Storm are among the four gift shops and kiosks available. Five services are offered including UBA and Ideal dental. Lastly, there are four offices available: Mansel oil, Vlisco, Netco Dietsmann, and Harps Petroleum.

Services provided at ceddi plaza

- There are standby generators with a capacity of 750 kva, as well as one generator specifically for emergency lighting and security during the night.
- The property has a borehole and a water treatment plant.
- The retail, commercial areas, and other common areas are centrally air-conditioned.

- Security measures include 24-hour surveillance with CCTV cameras
- There are two scenic lifts and a service lift.
- The property includes landscape gardens and parking facilities in the basement and at street level.
- Atriums have sitting areas.
- Cleaning and lighting of common areas are provided.
- The property is equipped with a five-alarm system and a water sprinkler system.
- There are TV satellite link-up, broadband Internet access, and a public address system available.



Plate 7: Approach view  
Source: <http://www.ceddiplaza.com/newplan.php>

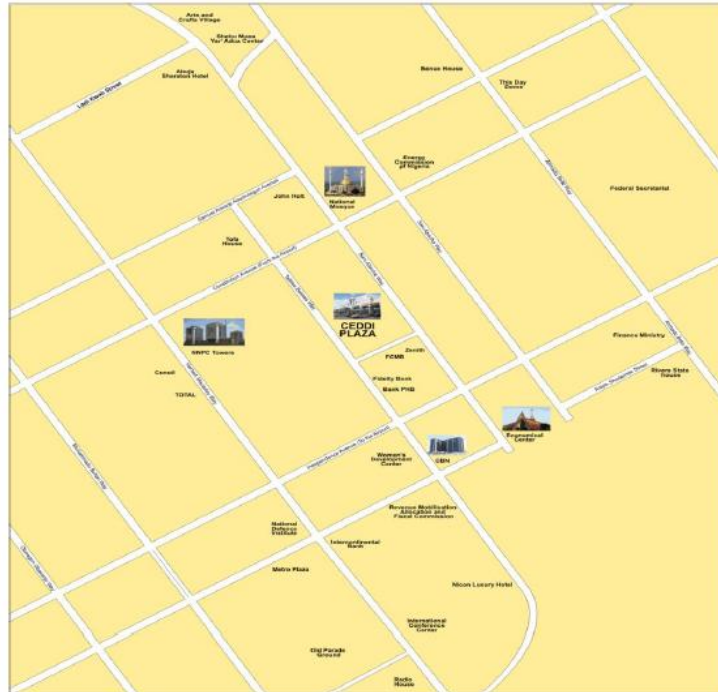


Figure 3.4: Site Plan

Source: <http://www.ceddiplaza.com/newplan.php>



Figure 3.5: Basement

Source: <http://www.ceddiplaza.com/newplan.php> Offices

**Shops Key**

This Key represents the services available in every shop

	Gift / Kiosk		Services		Vacant Shops		Entertainment		Furniture
	Health		Fashion		Electronics		Eatery		Grocery

Dryclinic, Skysnap Technologies, Aristotle, Ikani Salon, Aqua Massage Centre, Travel King, Toys 'n Things, Ideal Dental, the Management Office, GNC Live Well Pharmacy, Twice as Nice, Gene

Bendi, United Bank for Africa Plc, and Storm can be found in various shops in the area. Dryclinic is in Shop 1, Skysnap Technologies is in Shop 1 and 2, Aristotle is in Shop 10, Ikani Salon is in Shop 11, Aqua Massage Centre is in Shop 12A, DryClinic is in Shop 12B, Travel King is in Shop 3A and 3B, Toys 'n Things is in Shop 4, Ideal Dental and the Management Office are in Shop 5, GNC Live Well Pharmacy is in Shop 6, Twice as Nice is in Shop 7, Gene Bendi is in Shop 8, and Storm is in Shop Kiosk 1 and Shop Kiosk 2.

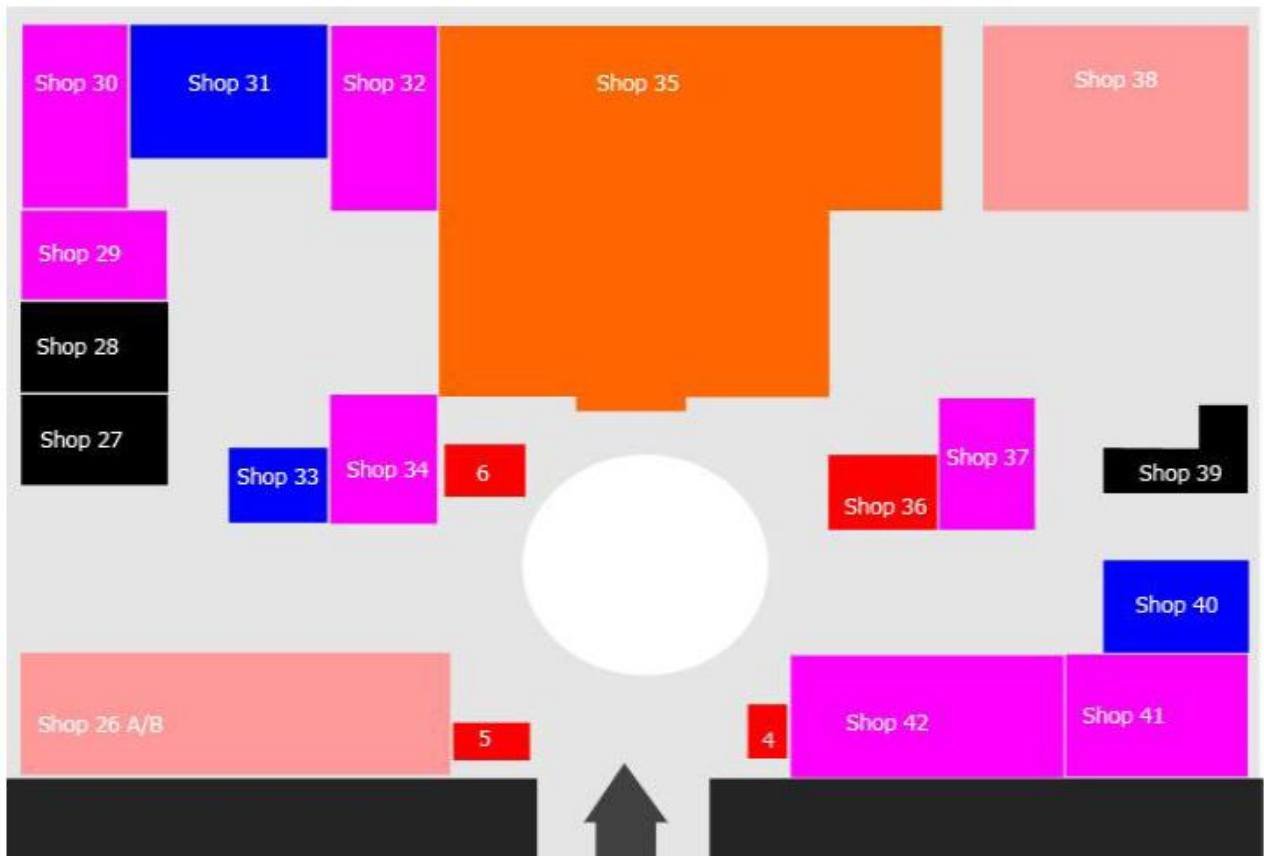
Do Not Copy, Lead City University, Nigeria

Figure 3.6: Ground floor  
 Source: <http://www.ceddiplaza.com/newplan.php>



Offices

13A): Health Plus, 13B): Etisalat, 14): Fastforward (Nike Stores), 16): Orpheus Company Limited, 17A): Vintage Watches, 17B): Ock Jewelry, 18): Svengali, 19A): Unspecified shop, 19B): Unspecified shop, 20): Levis, 21): Ruff and Tumble, 22): SPAR, 23): Swatch, 24): Cyni Traders, 25A/B): Sport World, Kiosk 13A): Newton n David



Do Not

Figure 3.7: First floor  
Source: <http://www.ceddiplaza.com/newplan.php>



## Offices

The following shops are located in Kilimanjaro: Shop 26A/B, Shop 27, Shop 28, Wisemen Apparel, Jems Accessories, Mims Afrik, Daviva, Gadget Place, Pierre Cardin, Silverbird Cinemas, Jemi Gifts, Feyi's Fabrics, Shop 38, Shop 39, Gloworld, Tiffany Amber, Shop kiosk 4, Suhjuiced, Bon Café.

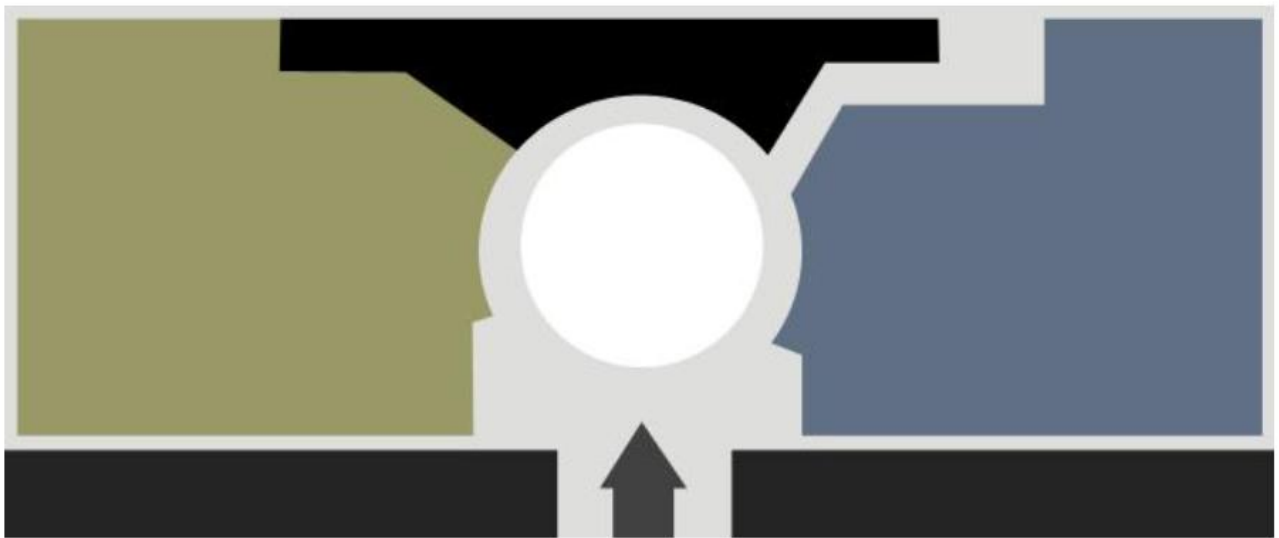


Figure 3.8: Second floor

Source: <http://www.ceddiplaza.com/newplan.php>

## Offices

Bedmate Nig. Int. Ent. Co. Ltd (Shop 1); Map Infotel (Shop 2); Guinness (Shop 3) Third floor



## APRAISAL

1. Various establishments such as stores, workplaces, and service providers.
2. Ample parking spaces located underground.

3. Leading destination for shopping and amusement in Abuja.
4. The circulation area within the compound is limited.
5. Interior lighting and ventilation rely heavily on artificial methods, allowing minimal or no opportunity for natural lighting and ventilation.



Plate 8: Showing elliptical staircases Plate 9: Showing walkway between emporium.



Plate 10: Showing circular pillar around the gallery. Plate 11: Showing atrium



Plate 12: Showing several floors of galleries



Plate 13: Exit staircases from the third floor down to the basement level



Plate 14: Showing circular core with facilities like pillars, lifts and pathway.

### 3.6.2 Appraisal: Entrance Observation

- All Entrance is clearly visible and prominent.
- Design of the Entrance is universally designed.
- Threshold to entrances are level or no greater than 5mm
- No retail shops along the walkway neither no outdoor activities for leisure purposes

### 3.6.3 Appraisal: Horizontal circulation

- The layout is in form of circular although direct.
- Access routes through open-plan area are well defined..
- Corridor wide enough (min 6000mm clear).
- The horizontal circulation elements help achieve uninterrupted circulation in buildings and provide smooth movements in between emporiums of the building

### 3.6.4 Appraisal: Vertical circulation

- Sign showing the use of a lift
- Whatever circulation method is used, alternative area stairs are provided

- An unobstructed manoeuvring space of 6000mm x 6000mm in front of any circulation measure
- Landing and call buttons located between 900mm x 1100mm from the landing
- A handrail be provided on at least one side of the equipment

### **3.6.5 Appraisal: Parking Area**

- Designated accessible car parking
- Size of parking spaces are not spacious enough to accommodate much cars
- Closeness to the entrances of the building only
- No Parking sign
- 

### **3.7.0 Case Study 3: The Palms, Lagos State**

- Name: T H E P A L M S , Lagos State
- Location - Lekki Peninsula, Lagos, Nigeria
- Opening date - March 2006
- Developer - Tayo Amusan/Actis
- Management - Tayo Amusan
- Owner - Persians Property Limited
- No. of stores and services - 69 shops
- No. of anchor tenants - 3
- Total retail floor area - 20,000m<sup>2</sup>
- Parking - 1,000 cars
- No. of floors -1 floor for shopping and an upper floor for a cinema
- Website - <http://www.thepalmshopping.com/>
- The Lagos Palms, the first world-class shopping centre in Nigeria, opened in February this year (2008) amidst great excitement and anticipation.



Plate 15: Rear view

Source: [www.thepalmshopping.com](http://www.thepalmshopping.com)

- The US\$40 million (R300 million) shopping and entertainment centre is located on a 44 000 m<sup>2</sup> site.
- The total built area is 23 600 m<sup>2</sup>, with a gross leasable area of 20 000 m<sup>2</sup> providing a wide range of retail and service outlets, a food court and five cinemas.
- In addition to the 800-space car park, a small car park caters for the tenants
- The developer of The Palms Shopping centre is Persianis Properties Limited (PPL), a joint venture between Actis and Snap Blu.

### 3.7.1 Appraisal: Property Description

The Palms has 62 shops that range in size from 28 to 590 square meters, as well as a food court and a five-screen NuMetro cinema complex. It is home to some of South Africa's top retailers, including three anchor tenants: Shoprite, Game, and Nu Metro. These three tenants occupy more than 50% of the mall's space and offer a variety of goods and entertainment options. The mall also

features major international brands like Clarins, Wrangler, and Konica. Broll Nigeria has been awarded a five-year contract to manage the property.



Plate 16: Rear view  
Source: [www.thepalmshopping.com](http://www.thepalmshopping.com)

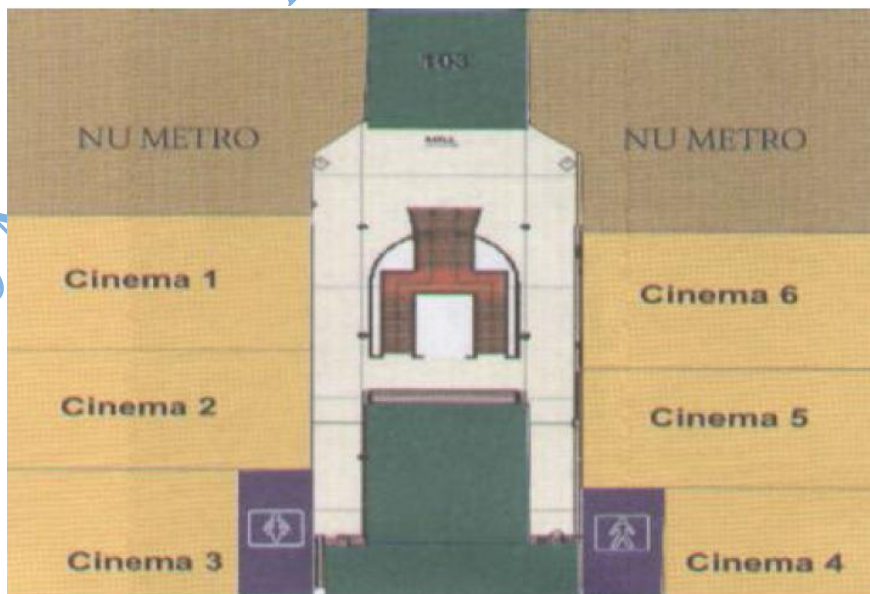


Figure 3.9: Upper floor Plan  
Source: [www.thepalmshopping.com](http://www.thepalmshopping.com)



Figure 3.10: Ground floor plan  
Source: www.thepalmshopping.com



Plate 17: Mall at night  
Source: www.thepalmshopping.com



Plate 18: Lobby

Source: [www.thepalmshopping.com](http://www.thepalmshopping.com)



Plate 19: Parking lots

Source: [www.thepalmshopping.com](http://www.thepalmshopping.com)



**Plate 20: Skylight**

Source: [www.thepalmshopping.com](http://www.thepalmshopping.com).

### 3.7.2 General Appraisal

- The Palms is conveniently situated near the Victoria Island business district and the growing affluent residential area of the Lekki Peninsula in Lagos, just a few kilometers away.
- The location is connected to the Lekki Expressway, providing easy access to Victoria Island, Ikoyi, and Lekki. It is surrounded by commercial and residential developments.
- To alleviate traffic congestion from the Lekki Expressway, the mall has two main entrances, as well as an alternative entrance through Ligali Ayorinde Street.
- The center is well-lit with high-tech lighting, offering shoppers both comfort and aesthetics. Metal halide lights are used inside the mall, while the exterior façade is illuminated for visibility at night.
- The design includes an efficient central air-conditioning system, and the energy supply is supported by a 2900KVA generating plant.

- Fire safety is a top priority, with efficient fire escapes, state-of-the-art fire detection systems, and a reserve water tank.
- The central air conditioning system is used to control the interior climate of the emporiums. Refuse management and control are effectively handled.
- The design and zoning of the emporiums are suitable for the tropical climate in which they are located.
- Sky lights and roof lights are used to provide natural lighting inside the building. The palm shopping center aims to be world-class and has facilities that fulfill the necessary functions.
- The building's image complements the surrounding environment and showcases modern architectural design.
- The mall and food courts aim to create a bustling atmosphere typical of a shopping center.
- The location of the center in the heart of Lagos may cause serious traffic issues in the future.
- The parking space available, which is 800, is inadequate for the number of visitors expected given the scale of the project and the location in Lagos.
- The facility also offers state-of-the-art amenities such as advanced security systems and surveillance, high-tech telecommunications and satellite infrastructure, wireless telephone points, and electrical points for signs.

### **3.7.3 Appraisal: Entrance Observation**

- Entrance is clearly visible and prominent.
- Design of the Entrance is universally designed.
- There is an adequate space inside and outside entrance doors.
- Threshold to entrances are level or no greater than 10mm with chamfered.
- There is a canopy or door recess for weather protection.

- All the retail shops along the walkway, their entrance is also clearly design visible for shoppers to patronize their goods and services.

#### **3.7.4 Appraisal: Horizontal circulation**

- The layout is logical and direct.
- Access routes through open-plan area are well defined.
- Seating at regular intervals in the walkways.
- Corridor wide enough (min 3000mm clear).
- The horizontal circulation elements help achieve uninterrupted circulation in buildings and provide smooth movements in between emporiums of the building

#### **3.7.5 Appraisal: Vertical circulation**

- At the building entrance, there is a sign indicating the presence of a lift or other vertical means of movement.
- Regardless of the chosen means of movement, there are additional stairs available as an alternative option.
- In front of any means of movement, there is a clear space measuring 3000mm x 3000mm for easy maneuvering.
- The landing and call buttons are positioned between 900mm x 1100mm from the landing area.
- At least one side of the equipment has a handrail for support

#### **3.7.6 Appraisal: Parking Area**

- The allocated parking area for disabled individuals is designed in a way that provides sufficient room to accommodate at least 200 cars.
- It is easily accessible from the parking spaces to the sidewalk.

- It is located in close proximity to all entrances or exit points. Additionally, there are visible signs indicating the designated parking spots.

### 3.8.0 Case study 4: Canal Walk, South Africa.



Plate 21: Exterior view canal walk Century City, Cape Town, South Africa.

Source: <http://www.canalwalk.co.za>

- Canal Walk is a shopping center located in Century City, Cape Town, South Africa. It was opened on October 26, 2000 and is managed by Hyprop Investments Limited and Ellerine Bros (Pty) Ltd. The center contains over 400 stores and services, including 20 cinemas and restaurants. It has a total floor area of 125,000m<sup>2</sup> for retail space and 9,600m<sup>2</sup> for office space. The number of available parking spaces is unknown. Canal Walk has 2 floors and its website can be found at: Website - <http://www.canalwalk.co.za/>

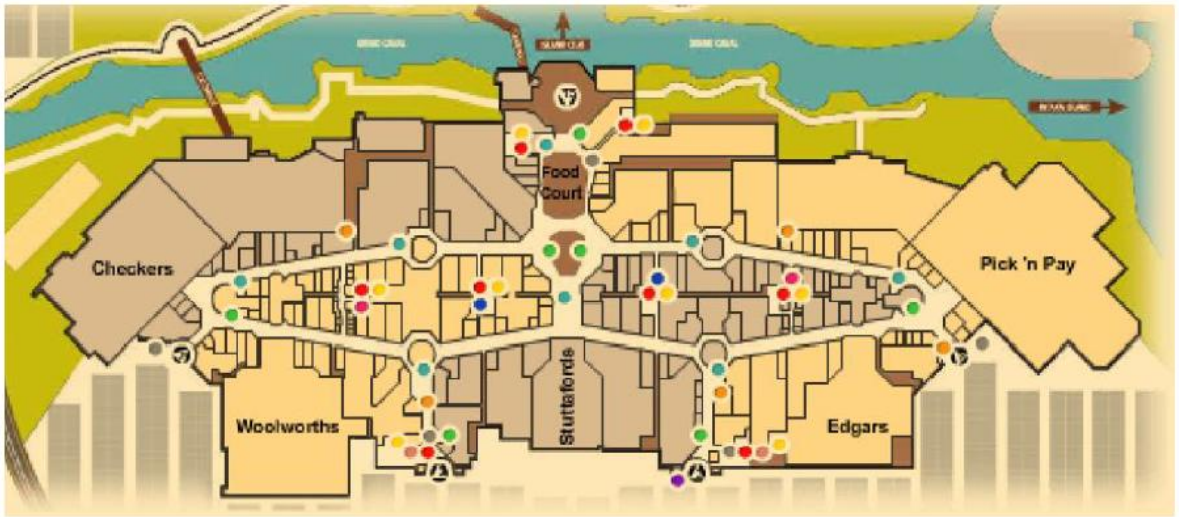


Figure 3.11: Ground floor Plan, Canal walk, Century City, Cape Town, South Africa,  
Source: <http://www.canalwalk.co.za>

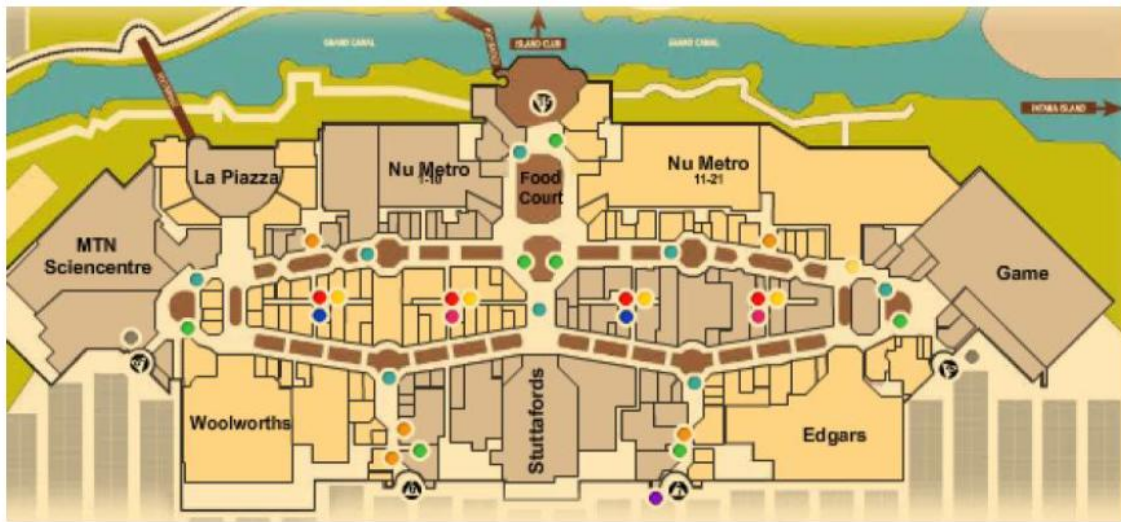


Figure 3.12: First floor Plan, Canal walk, Century City, Cape Town, South Africa.  
Source: <http://www.canalwalk.co.za/>



Figure 3.13: Legend: Canal walk, Century City, Cape Town, South Africa.  
Source: <http://www.canalwalk.co.za/>

### 3.8.1 Appraisal: Property Description

Canal Walk is a shopping center in Cape Town, South Africa, spanning an area of 125,000 m<sup>2</sup>. It is situated within Century City, a diverse development that encompasses not only the shopping center, but also office buildings, residential areas, and the Ratanga Junction theme park.



Plate 22: Shoppers during a summer's evening, Canal walk, Century City, Cape Town, South Africa. Source: Wikipedia, the free Encyclopaedias

Canal Walk is Africa's largest shopping center in terms of rentable space, although the Gateway Centre in Durban is bigger overall. In Johannesburg, the Sandton City complex is even larger if you include the Nelson Mandela Square annex. The shopping center, built in the style of "Cape Venetian architecture," houses over 400 stores, numerous dining options, 20 cinemas, a game arcade, and the MTN Sciencentre, an interactive science center that attempted to set the world's largest cellphone record in 2007. Since its opening in 2000, the center has become a popular

destination for the numerous tourists who regularly travel to Cape Town from around the world.



Plate 23 Atrium-like glass ceilings provide natural light to the double-storey mall, Century City, Cape Town, South Africa.

Source: Wikipedia, the free Encyclopedia

Canal Walk, costing approximately R1.3 billion, was finished on October 26, 2000. It became Africa's largest shopping center with 125,000m<sup>2</sup> of retail space and two office towers that offered 9,600m<sup>2</sup> of office space. The contract for Canal Walk, worth R900 million, was the most significant private sector contract ever awarded in South Africa during that period. In October 2003, Hyprop Investments Limited (80%) and Ellerin Bros (Pty) Ltd (20%) purchased Canal Walk.



Plate 24: A massive food court with multi-media entertainment, Century City, Cape Town, South Africa. Source: Wikipedia, the free Encyclopaedia

### 3.8.2 General Appraisal

- Canal Walk is a modern shopping center that aspires to be world-class. It has been designed with facilities that fulfill their intended purposes effectively.
- The mall is spread over two floors, allowing for ample opportunities for window shopping. The inclusion of food courts and a bustling atmosphere enhances the overall shopping experience.
- The shopping center is equipped with a central air conditioning system to control the indoor temperature.
- There is also efficient management and disposal of waste.
- The design and layout of the shopping center are suitable for the tropical climate of its location.

- The use of skylights and roof lights contributes to brightening the interior space. With over 400 shops, a wide variety of products and goods will be available for customers.
- Sufficient availability of escalators, elevators, phone booths, and other service amenities.
- The design of the building is nearly symmetrical; however, the sizes and shapes of the spaces are inconsistent, leading to challenging and less efficient planning.

### **3.8.3 Appraisal: Entrance Observation**

- All Entrance is clearly visible and prominent.
- Design of the Entrance is universally designed.
- Inadequate space inside and outside entrance doors.
- All the retail shops along the walkway, their entrance is also clearly design visible for shoppers to patronize their goods and services but prone to traffic congestion due to the width.

### **3.8.4 Appraisal: Horizontal circulation**

- The layout is logical.
- Access routes through open-plan area are not well defined.
- Seating at regular intervals in the walkways.
- Corridor in not wide enough .

### **3.8.5 Appraisal: Vertical circulation**

- The entrance and interior of the building have signs indicating the presence of a lift or other vertical transportation options.
- Regardless of the chosen method of transportation, there are additional stairs available as an alternative.
- Furthermore, it is required to have a handrail on at least one side of the equipment.

### **3.8.6 Appraisal: Parking Area**

- Designated accessible car parking

- Size of parking spaces are not spacious enough.
- Inconvenient access from the parking spaces onto the footpath

### 3.9.0 Case Study 5: Mall of America, Bloomington, Minnesota, United States.

#### Mall of America.



Plate 25: Front elevation, Mall of America, Bloomington, Minnesota, United States of America.

Source: <http://www.mallofamerica.com>

The location of this place is in Bloomington, Minnesota, United States. It is situated at coordinates 44°51'15"N 93°14'32"W. It was opened on August 11, 1992, and was developed by Melvin Simon & Associates & Triple Five Group. The management of this place is carried out by Triple Five Group. There are over 520 stores and services available at this location. It has four anchor tenants and a total retail floor area measuring 2.5 million sq ft. (230,000 m<sup>2</sup>). Additionally, there are 20,000 parking spaces available, including two 7-story ramps and overflow surface lots.

#### 3.9.1 Appraisal: Property Description

Mall of America, also known as MOA or the Megamall, is a massive shopping mall located in Bloomington, Minnesota, a suburb of the Twin Cities. It is positioned in the southeastern intersection of Interstate 494 and Minnesota State Highway 77, just north of the Minnesota River. The mall is conveniently situated across the interstate from the Minneapolis-St. Paul International Airport. In terms of retail space, it is the second largest enclosed mall in the United States, but it holds the record for the largest overall enclosed floor area. The mall opened in 1992 and attracted

an astonishing 40 million visitors in 2006. The Triple Five Group owns and operates the property entirely.



Figure 3.14: Ground Floor Plan, Mall of America, Bloomington, Minnesota, United States  
Source: <http://www.mallofamerica.com>



Figure 3.15: First Floor Plan. Mall of America Bloomington Minnesota, United States of America.  
Source: <http://www.mallofamerica.com>



Figure 3.16: Second floor plan, Mall of America, Bloomington, Minnesota, United States of America.

Source: <http://www.mallofamerica.com>

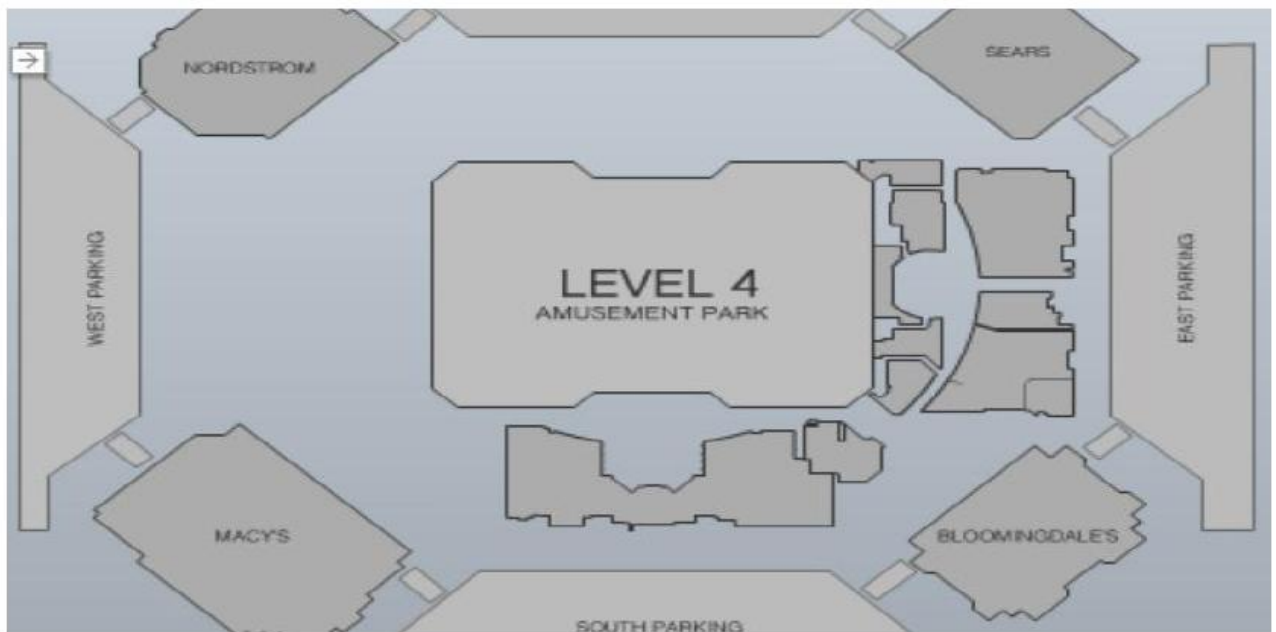


Figure 3.17: Third floor plan, Mall of America, Bloomington, Minnesota, United States of America.

Source: <http://www.mallofamerica.com>



Plate 26: Interior view of atrium, Mall of America, Bloomington, Minnesota, United States,  
Source: <http://www.mallofamerica.com>

The Mall of America covers a vast area of 4.2 million square feet, with 2.5 million square feet available for retail purposes. Its architectural design is almost symmetrical and features a roughly rectangular layout. The mall consists of over 520 stores, spread across three levels of pedestrian walkways along the sides of the rectangle, with an additional level on one side. A future expansion to the north will enable the inclusion of up to 900 stores. Positioned at the corners are four main department stores. The mall is divided into four distinct zones, each possessing its own decorative style.



Plate 27: A departmental store in the mall, Mall of America, Bloomington, Minnesota, United States of America.

Source: <http://www.mallofamerica.com>

Despite the freezing winter temperatures in Minnesota, only the entrances of the mall are warmed. Heat enters through skylights located above Nickelodeon Universe. The heat is generated by lighting fixtures, other electrical devices, as well as the presence of mall employees and guests, which is enough to maintain a comfortable temperature inside. Surprisingly, even in the winter, air conditioning systems have to be continuously operated during busy periods to guarantee a pleasant shopping atmosphere.

There are two parking ramps with seven stories each, located on the east and west sides. These ramps offer a total of 12,550 parking spaces. Additionally, there are parking lots on the north and south sides of the building and nearby overflow parking. Together, these areas provide about 20,000 parking spaces.



Plate 28: A departmental store in the mall, Mall of America, Bloomington, Minnesota, United States of America. Source: <http://www.mallofamerica.com>

The mall acts as a central transportation hub for the area, connecting it to other places through bus and light rail services. Public transportation is provided by Metro Transit and other local bus lines, and Mystic Lake Casino offers free shuttle services. The main bus and rail station for local service is located in the lower level of the eastern parking ramp. This station links the mall to the Minneapolis-Saint Paul International Airport and downtown Minneapolis. However, the mall is no longer recommended for park and ride purposes, and overnight parking is not allowed to discourage passengers from using the train to the airport. Instead, commuters are encouraged to use the parking lot at the nearby 28th Avenue Station.

### 3.9.2 General Appraisal

- The Mall of America is a modern and internationally acclaimed shopping center with a focus on providing world-class facilities.
- It is a multi-storey complex that not only offers a wide range of amenities such as an amusement park, office spaces, and restaurants, but also has a multi-level parking facility to cater to the needs of visitors and customers. The mall and food courts are designed to create a bustling atmosphere, which is a key characteristic of a shopping center.

- The internal climate is regulated through a central air conditioning system, while proper management and control of refuse are ensured.
- The mall's design and zoning are suitable for the tropical climate of its location. Sky lights and roof lights are incorporated to provide ample natural light inside the building. With over 520 shops, the mall offers a diverse range of products and merchandise.
- Essential service facilities like escalators, lifts, and telephone booths are also provided.
- However, due to its sizable nature, the shopping center may pose challenges in terms of maintenance.

### **3.9.3 Appraisal: Entrance Observation**

The Entrance is easy to see and can be easily noticed by anyone. The design of the Entrance is universally accessible. There is enough room both inside and outside the entrance doors. The thresholds to the entrances are level or have a slight slant of no more than 10mm. There is a canopy or recessed door to protect against bad weather. Additionally, all the retail shops along the walkway have entrances that are clearly designed and visible, making it convenient for shoppers to visit and support their businesses.

### **3.9.4 Appraisal: Horizontal circulation**

The organization of the space is coherent and straightforward. Clear pathways are established throughout the open-plan area. There are seating areas placed regularly along the walkways. The corridors are of sufficient width, at least 6000mm, to allow for easy movement. The horizontal circulation elements contribute to uninterrupted movement within the building, making it easy to transition between different sections of the building.

### **3.9.5 Appraisal: Vertical circulation**

- A sign indicating the presence of a lift or other vertical movement options is located at the building entrance.
- In addition to the chosen circulation method, alternative stairs are available.
- There is a clear space of 3000mm x 3000mm in front of any circulation measure.

- Landing and call buttons are positioned between 900mm x 1100mm from the landing.
- A handrail must be provided on at least one side of the equipment.

### **3.9.6 Appraisal: Parking Area**

- Specifically assigned designated parking spaces for accessibility purposes
- Parking spaces are large enough to fit a minimum of 300 cars
- Easy access from the parking areas to the sidewalks
- Proximity to all entrances and exits
- Clear signage indicating parking areas

### **3.10.0 Case Study 6: Wave Mall (Noida)**

The area is flat and the size of the site is 8777 square meters. There are two entrances, one of which is for parking. The building covers 41% of the ground area. The building has setback distances of 7.5 meters on the sides, 4 meters in the rear, and 25 meters in the front. The building has a height of 26 meters, with six floors above the ground floor. The total built-up area is 20,576 square meters.

### **3.10.1 General Appraisal**

#### **Parking lots**

There is parking available on the lower ground floor and basement at level -2. The total parking area measures 4700 square meters, accounting for 23% of the overall built-up area. The total number of car parking spaces is 110, distributed on the lower ground floor and two basements.

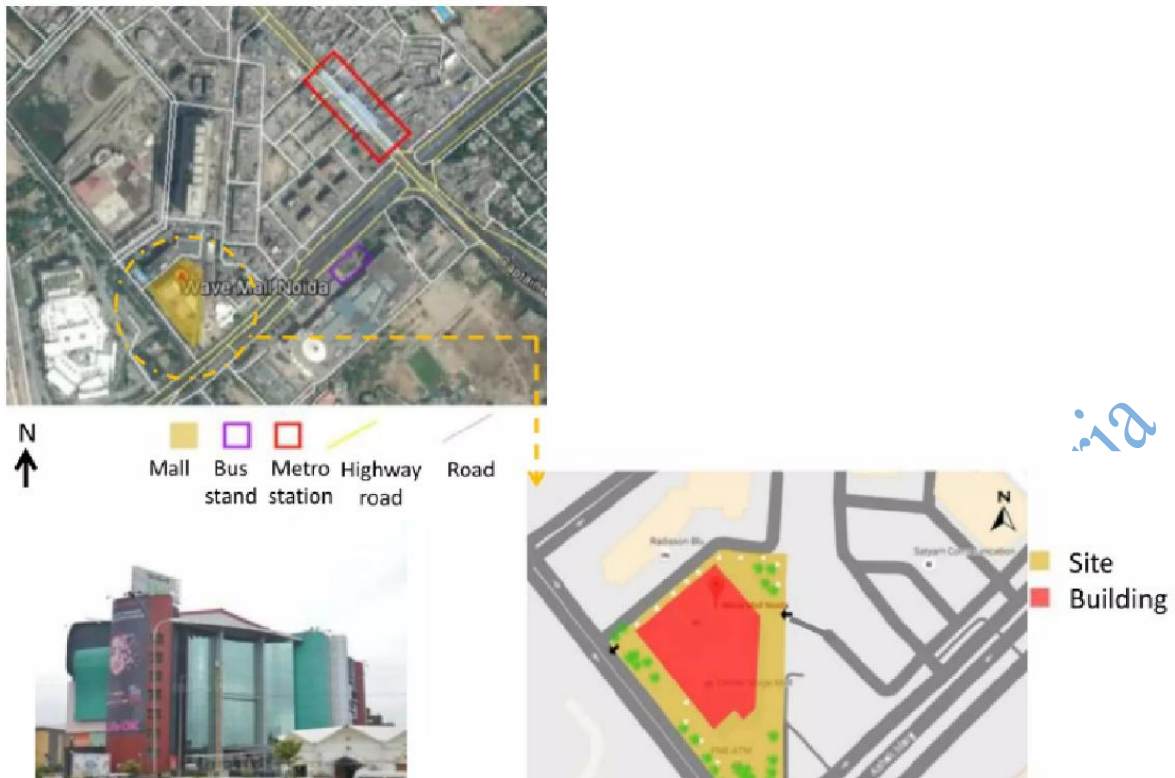


Figure 3.18: Parking lots

### Appraisal

- In order to ensure a smooth movement of vehicles within the site, it is important for the layout to be designed efficiently.
- Additionally, a significant amount of parking space should be available in order to accommodate the crowd, typically around 60% of the total built up area.

### Lobby/Ground floor plan division

### Horizontal and Vertical Circulation

Follows a linear hierarchy

There are capsule lifts, 2 escalators, and 5 staircases. The corridors are 3m wide and one of the staircases is also 3m wide. There are two staircases that are 2.5m wide and two staircases that are 1.5m wide. Additionally, there is one more staircase.



Figure 3.19: Site Plan

### Appraisal

- Sufficient common areas should be available in order for any visitor to have a clear view of the mall and understand its layout, which would facilitate their movement.
- Additionally, it is essential to include eating spaces, as dining is a crucial requirement that cannot be disregarded



Figure 3.20: Basement Circulation



## Horizontal and Vertical Circulation

Follows a linear hierarchy.

There are several modes of transportation available in the building, including capsule lifts, escalators, and staircases. The corridors are also 3m wide, while some of the staircases vary in width, with two being 2.5m wide and two being 1.5m wide. Lastly, there is one additional staircase.

## Appraisal

- The main floor is crucial in forming the impression of visitors, as the first impression tends to be lasting.
- It is characterized by a large open area that serves as a barrier between the outside and inside, helping to ease the often-disorienting transition.
- However, it is not advisable to exclude toilets on this floor, as this is not a wise choice in the planning phase.

## First Floor Plan

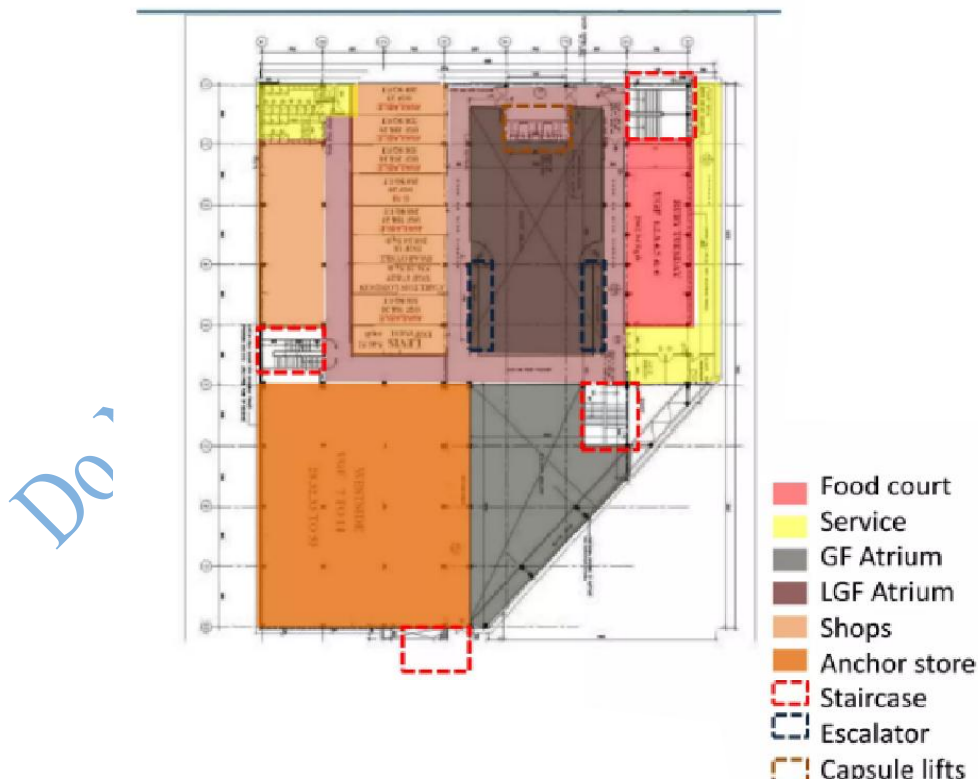


Figure 3.23: first floor

## Vertical Circulation

Follows a linear hierarchy.

- There are a total of 2 capsule lifts, 2 escalators, and 4 staircases. The corridors are 3m wide and there are two staircases that are 2.5m wide and one staircase that is 1.5m wide. There is also one additional staircase.

## Appraisal

While it is important to have an aspect of attraction, it should not be the sole focus. The main purpose of this program is to provide ancillary spaces. The design of these spaces should prioritize efficiency, ensuring that maximum area is made available for leasing or tenants. It is important that each space has equal access to the crowd and is easily visible. Anchor stores need to be strategically positioned to allow small shops to thrive, rather than being immediately followed.

All spaces should have fair and equal access to the crowd and be within their immediate line of sight. The placement of anchor stores should be such that they are not directly followed, allowing smaller shops to have a chance to thrive.

## Second floor plan

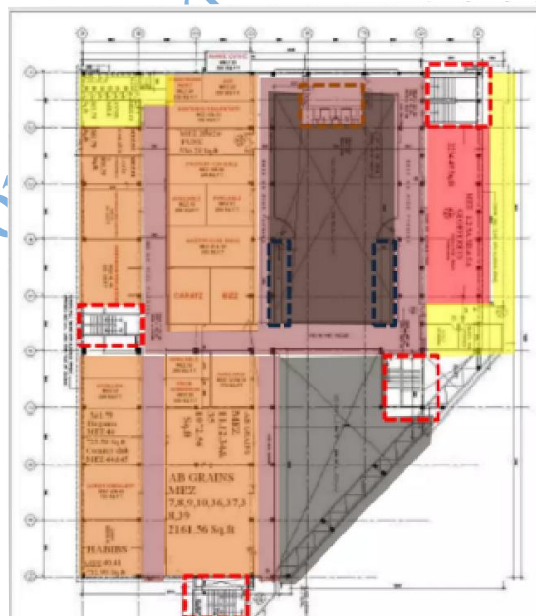


Figure 3.24: Second Floor Plan

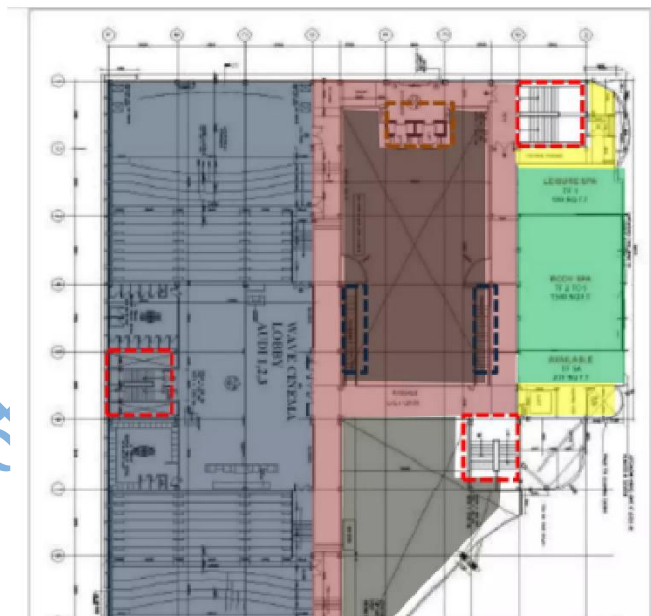
## Horizontal and Vertical Circulation

Follows a linear hierarchy.

- Capsule lifts, 2 escalators, 4 staircases
- 3m Wide corridors, 3m wide
- staircase (2nos), 2.5m wide
- staircase (1nos), 1.5m wide
- staircase (1no)

## Appraisal

- It is important to have consistent and comparable spaces in order to ensure a smooth flow of shoppers.
- It may be beneficial to occasionally include eateries in the area.
- The provision of a sufficient number of toilets is crucial as they are essential.
- The segregation between service areas and public areas should be appropriately managed.



Third Floor Plan  
Figure 3.25: Third Floor Plan

## Horizontal and Vertical Circulation

Follows a linear hierarchy.

- There are two elevators called capsule lifts, five staircases, and two escalators in the building. The corridors are three meters wide, and there is also a three-meter wide staircase with two flights. Additionally, there is a 2.5-meter wide staircase with one flight and a 1.5-meter wide staircase with one flight.

## Appraisal

- The flow of spaces is interrupted to create variety. Includes different types of spaces.
- This is done to prevent the shopping experience from becoming dull.
- It is important to have multiplexes of various standards as they also attract visitors to the mall.
- There should be enough space for ticketing and service areas.
- The rooms should have proper emergency facilities and the latest technologies.



Fourth Floor Plan  
Figure 3.26: Fourth Floor Plan

## Horizontal and Vertical Circulation

Follows a linear hierarchy.

- Capsule lifts, 2 escalators, 4 staircases
- 3m Wide corridors, 3m wide
- staircase (2nos), 2.5m wide
- staircase (1nos), 1.5m wide
- staircase (1no)

## Appraisal

- Each theatre will share a single lobby.
  - It is necessary to have a temporary space between large gathering areas in order to prevent chaos or disorder.
- Upper floors will offer additional areas like gaming zones and attractions. While not immediately needed, it should still be able to attract a large crowd and have sufficient capacity to accommodate them.

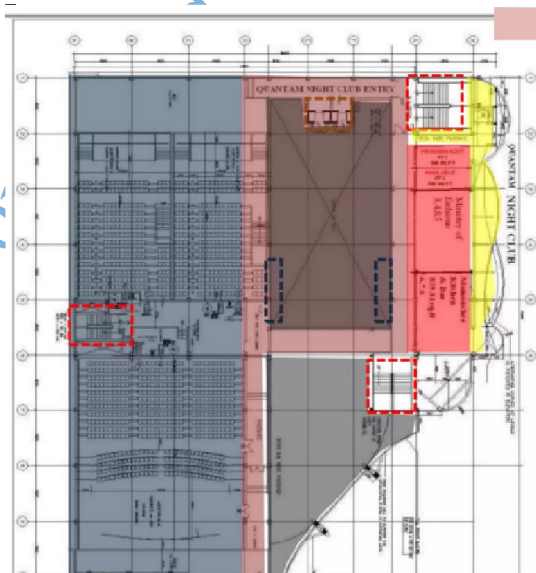


Figure 3.27: Fifth Floor Plan

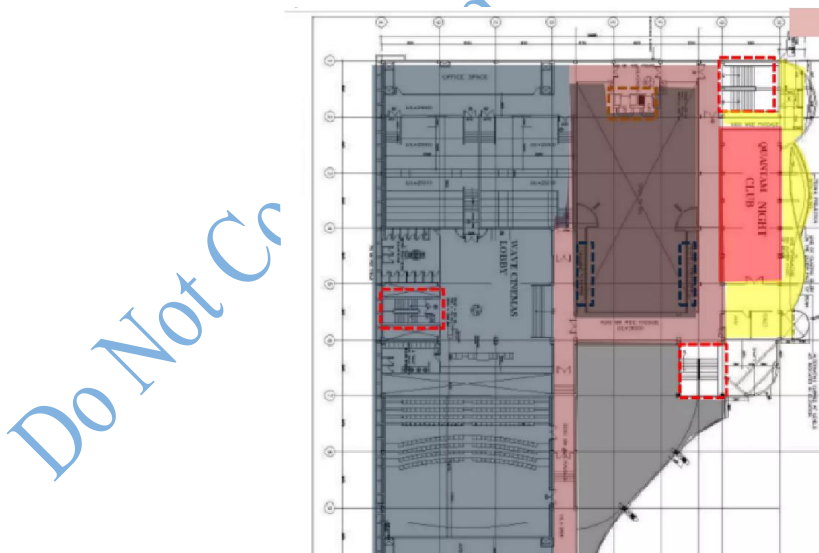
## Horizontal and Vertical Circulation

Follows a linear hierarchy.

- Capsule lifts, 2 escalators, 4 staircases
- 3m Wide corridors, 3m wide
- staircase (2nos), 2.5m wide
- staircase (1nos), 1.5m wide
- staircase (1no)

## Appraisal

- Theaters should have a shared lobby area.
- To prevent chaos or disorder, any venue for large gatherings should have a temporary buffer zone.
- Areas for activities such as gaming and attractions should be located on higher floors.
- Although not urgently needed, it should be spacious enough to attract a large number of people.



Sixth Floor Plan  
Figure 3.28: Sixth Floor Plan

## Horizontal and Vertical Circulation

Follows a linear hierarchy.

- Capsule lifts, 2 escalators, 4 staircases
- 3m Wide corridors, 3m wide
- staircase (2nos), 2.5m wide
- staircase (1nos), 1.5m wide
- staircase (1no)

## Appraisal

- The theaters share a common lobby.
- A temporary buffer zone is necessary for any place where a large number of people gather to prevent chaos or violence
- The upper floors include spaces such as a gaming zone and attractions.
- Although not urgently needed, it is still highly popular and attracts a large crowd.
- It is spacious enough to accommodate a significant number of people.
- There is a lack of sufficient toilets.
- There are no toilets specifically designed for people with disabilities.
- Entrances and exits have been placed on different levels to manage traffic flow during busy periods

## CONNECTIVITY

- The third and sixth floors of the building house multiplexes, which can be accessed via escalators, lifts, and stairs.
- The multiplexes are all connected by a shared corridor, and there is also a common lobby provided for both of them.



Roof above the atrium

Plate 29: Atrium



Plate 30: Interior showing cinema

### Appraisal

- The building has effectively used its exterior surface for branding and advertisements without compromising the aesthetic appearance of the building's elevation.
- It has a modern appearance by using trendy materials such as aluminum composite panels and glazed facades.
- The entrance lobby and atrium are covered with fiberglass, allowing natural light to enter while efficiently reducing the need for artificial lighting.

- Plumbing, electrical, HVAC, and generator rooms are located in the -2-basement level to provide necessary services.

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## **Chapter Four**

### **Site Analysis and Design Synthesis**

#### **4.0 Brief Analysis**

#### **4.1 Design Brief**

Nevertheless, in Ibadan, a majority of the current shopping centers are experiencing issues with their circulation. The current circulation pattern is disorganized and unclear. The purpose of this study is to analyze and quantify the circulation system in the existing shopping malls in this specific region, in order to identify any shortcomings in the mall's circulation and create better conditions for movement, with the goal of designing a more efficient shopping center. The objective of this research is to assess the movement within the existing shopping centers by evaluating their circulation systems and entrances in the designated study area. The proposed shopping mall will be an archetypal of structures for the people of Oyo state and Nigeria at large. The design project shall provide fully functional facilities for shopping, Eateries and entertainment. It shall provide sufficient activity spaces adequate zoning of functions. The scope of work shall include a design proposal for a Shopping mall with a primary focus on space-function resolution analyzing The architectural implication of designing spaces for the Following in the mall.

##### **4.1.1 Design Brief Development**

A number of spaces were found to be common to all the six case studies examined in this study. These spaces were studied critically to determine the standard required, the number of units per people, their capacity and exact function they perform in a mall design. These spaces are;

- Outdoor parking
- Outdoor Retail shop
- Anchor store
- Retail shops
- Warehouse

- Large circulation
- Delivery/loading bays
- Service parking
- Staff area
- Service circulation
- Security post
- Convenience

## 4.2.0 Study Area

### 4.2.1 Site Location

The site of the proposed Ceci Mega Mall is located along Along Akala expressway, Ibadan Oyo State, Ondo state Nigeria.

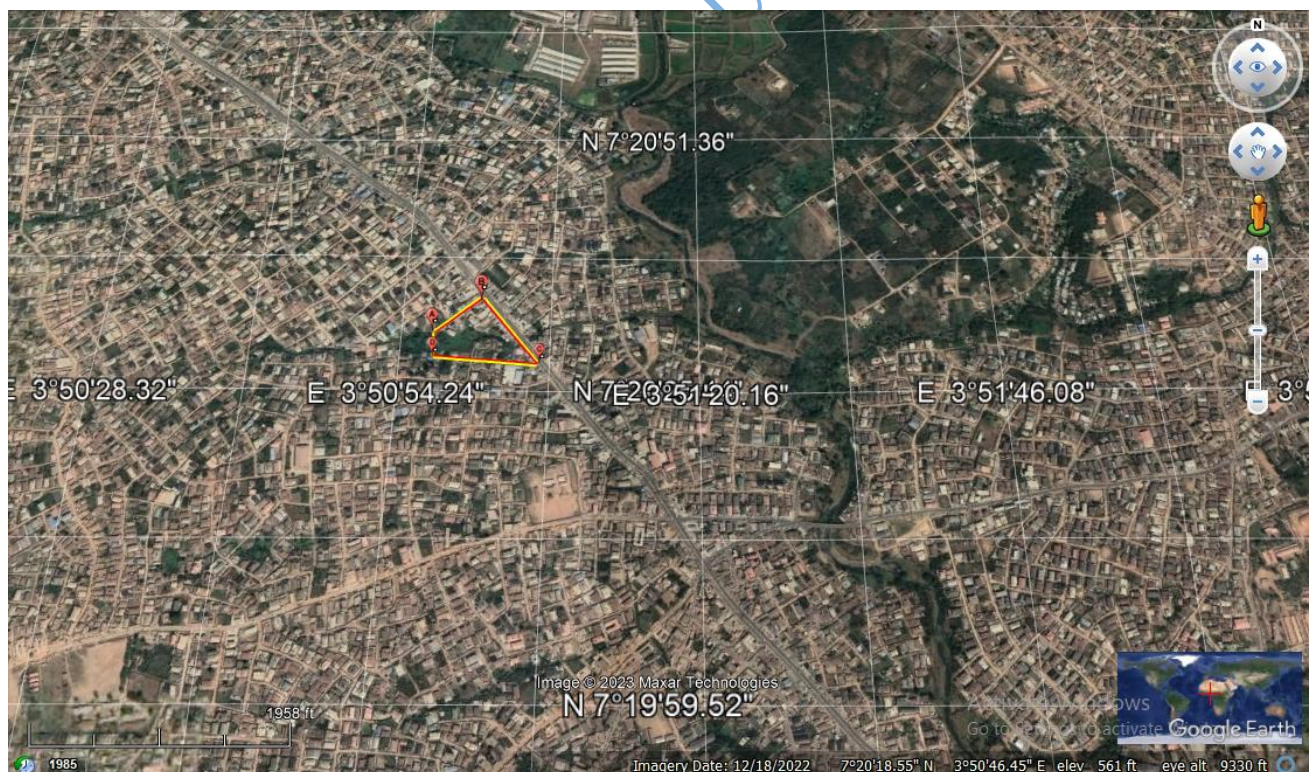


Figure 4.1: Site location map  
Source; Researcher`s field work

#### 4.2.2 Site Location Criteria

Site analysis to determine the existing features on site that will in anyway affect a proposed design is very important and should be done at the commencement of the design process. A number of characteristics peculiar to the proposed site influenced its selection. They include;

- The site is also zoned to accommodate this building typology.
- Factors suggested in the choice of selection site:
- Topography, that is, an area that can be built with less expenses.
- Adequate size and suitable (regular) shape.
- The presence of social amenities and services such as telephone, electricity and water supply on the site and installable at acceptable cost.
- Availability of site for development at one of the heart (centre) of the city of Ibadan.
- Accessibility, that is, easily accessible location, preferably a site along one of the major streets of the city
- Good climatic factors such as moderate temperature, rain etc.

#### 4.3 Site Analysis

The site is a very important aspect of a design proposal being the point at which the tangible percentage of a development emerges or starts making an impact. The site chosen for any project hence goes a long way in determining the final resultant composition of the solution-in-all aspects. The site and its environment determine the solution in terms of contextual appropriateness measured by geographers, geologists, and geometers. The specific aspect of the site, its micro-climate is thus a complex interaction of any factor, orientation, scope, topography, temperature patterns, humidity, precipitation, vegetation, presence or absence of water, seasonal availability of sunlight especially in urban areas, the influence of other buildings etc. The success of any design in this case to a large extent depends on a wise and informed site selection. The layout of the building on site will greatly be determined by the topography and physical features (such as water bodies, access, trees, local climate, utility lines) seen on site. The existing features in close proximity to the

site will greatly influence the character of the building to be built in terms of forms, beauty and economy of the design. A thorough analysis of the project site that enhances an in-depth understanding of its suitability to the intended purpose is necessary. The reason is to achieve the aim of the design. Site analysis helps in the functional development of the relationship that exists between the site and the structure. Every design solution should aspire to be a function of the site and also a direct reflection and adaptation of its environment.

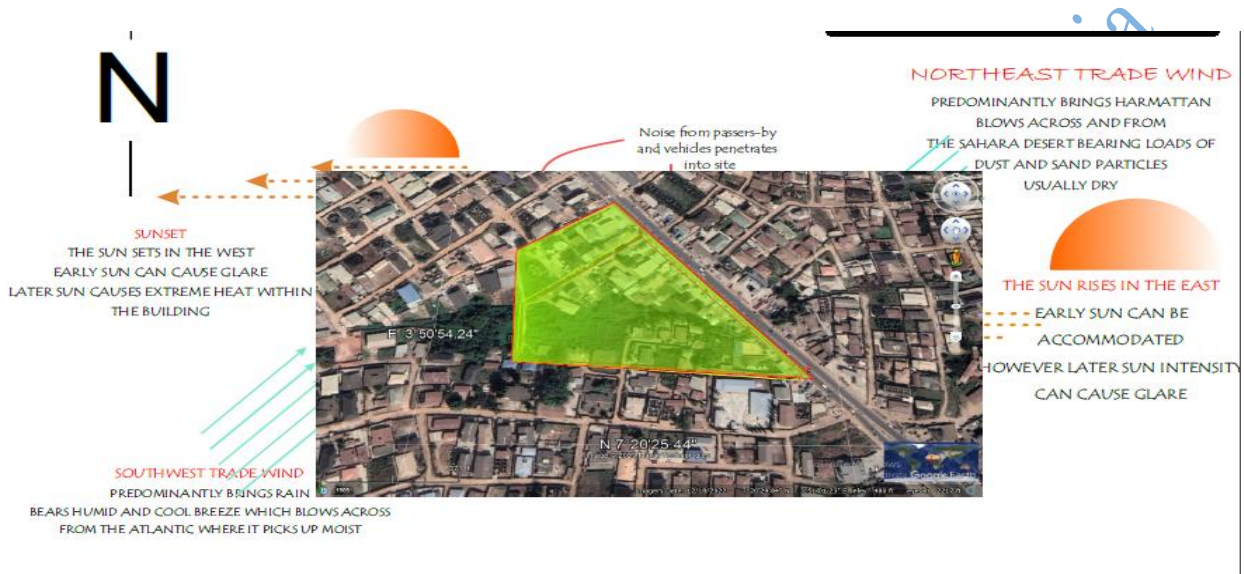


Figure 4.2: Site analysis  
Source; Researcher's field work

### **Site Accessibility**

The site has easy and convenient access for both vehicular and pedestrian. The site is accessible from the major road.

### **Nearness to Public Utilities**

The site has satisfactory access to basic infrastructures e.g., Security, Electricity, Water, Good Roads, Telecommunications etc

### **Drainage and Topography**

The site has a gentle slope spread evenly all over. It is however necessary to create a slope that encourages rainwater flow towards a part of the site for collection.

### **Vegetation**

Ibadan is situated within the tropics, therefore it enjoys dual distinct period which are the cold and dry seasons. This enables a extensive range of vegetation ranging from dense undergrowth, small grasses to evergreen trees in the site's immediate neighborhood. Soil is loamy, and it is presumed to have adequate bearing capacity. The Site has relatively good and firm grounds with good load bearing capacity suitable for the construction of the proposed mall. There are no landforms on the project site save for trees and shrubs. The site is covered with shrubs, thick grass, and vegetable leaves and trees. All the vegetables and shrubs are to be removed. The site displays a relatively thick vegetation cover that is; there are tall grasses, shrubs as well as big trees.

### **Soil Condition**

It has a firm laterite soil with good sub-surface condition for construction and landscaping. It gives satisfactory geological and soil condition with no rock crops. Also, soil with clay (sticky) properties can be gathered on site to make Hydraform, the hydraulic compressed brick used on site.

## **Wind Direction**

The north-east trade wind brings cold, dust, harmattan and these cause discomfort. The south west trade wind brings cold humidity which gives comforting effect to the people. Proper ventilation is considered as part of the building effective arrangement. Natural inlet of air is one of the bedrock of this design therefore, the building's long sides (east and west) elevations are positioned such that they receive the maximum amount of air. The shorter sides of the proposed mall face the direction of the north-east trade wind

## **Sunlight and temperature**

Ibadan is termed the sunshine state because of how bright the sun is throughout the year. Solar gain and temperature are an important factor as solar energy is needed to provide electricity to run the proposed mall. The proposed building is positioned such that sun rises and moves across on the shorter part reducing the amount of excess heating coming into the building. Solar panels are placed across this sun path on the roof and over the parking area on site to gain as much incident solar radiation throughout the day.

### **4.4.0 Project Analysis and Design Synthesis**

#### **4.4.1 Conceptual Development**

The design concept is based on the analysis, functionality and combination of spaces resolved in to a desirable form. Thoughts birth from precise elements from shopping mall the shopping trolley. The activities of each spaces are interrelated and linked to the centralized circulation system.

The sun path and other exiting features on site were considered in all of these arrangements. Entrances and exits to the building itself are placed to seamlessly flow with pedestrian assigned walkways and vehicular paths.

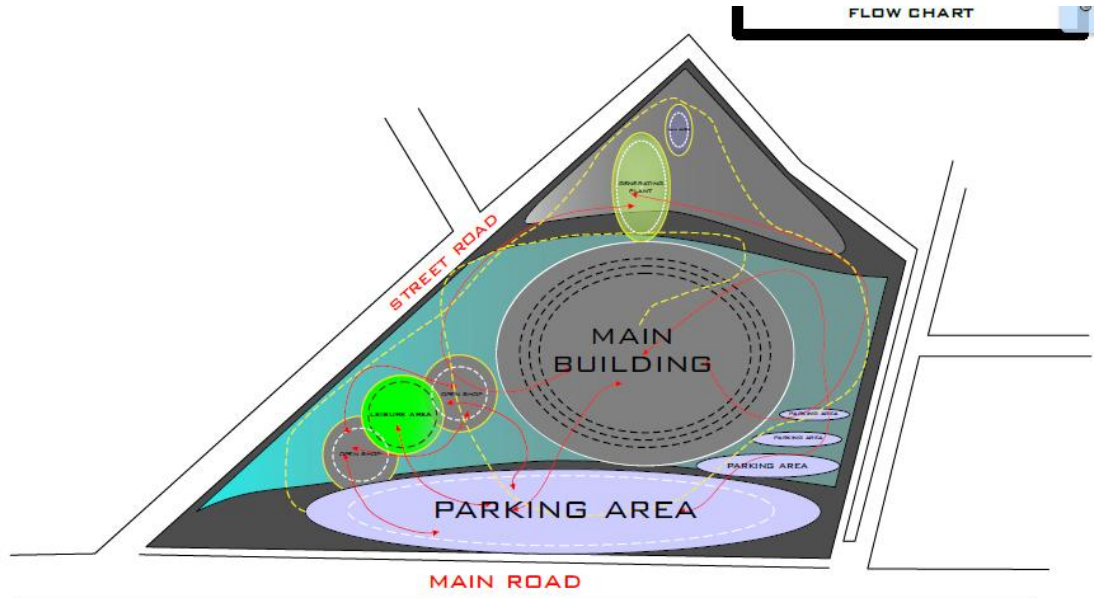
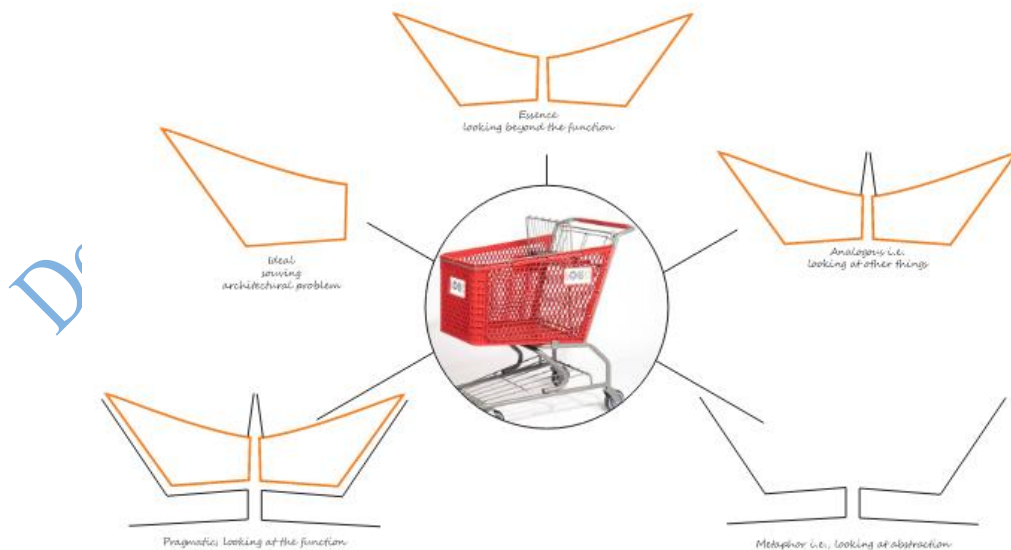


Figure 4.3: Site concept/zoning  
Source; Researcher's field work

### Building concept

Stack effect, the shading of a tree, a section of a tree cell with its shape and biological functioning (Biophilic & Biomimetic design) was what combined to inspire the shape/internal configuration and functionality of this design. The building will be raised on columns to allow the inlet of air from the ground floor. Air raises to cool the major circulation area and escapes through the atrium.



*The activities of each spaces are interrelated and linked to the centralized circulation system.*

Figure 4.4: Conceptual development  
Source; Researcher's field work

### 4.3.2 Space Allocation/ Schedule of Accommodation

#### Recreation/Entertainment

- Cinema halls
  - Office
  - Drinks and Snacks
  - Ticket Room
  - Cinema Hall
- Game arcade and Bowling Alley
  - Ticket Unit
  - Drink and Snacks
  - Open Office
  - Staff Lounge
  - Storage
- Fitness Centre (Gym and Spa)
  - Changing Room
  - Toilets

#### Commercial

- Ceci Anchor Store
  - Security Post
  - Payment Unit
  - Store
  - Stock Room
  - Sea food Unit
  - Bakery Unit
  - Fast Food Unit
- Retail shops A
- Retail shops B
- Retail shops C
- Restaurants
  - Dinning
  - Kitchen
  - Cold Store

Office

Dry Store

Toilets

Servery

- Banks

ATM Gallery

Office

Toilet

Cashier's seat

Hall

**Other Ancillary Facilities**

- Parking 400 car lots
- Convenience
- Storage spaces
- Delivery/loading bays
- Mechanical & electrical rooms, Technical
- Circulation grouped with services.
- Refuse disposal area.
- Recycling building
- Stair Hall
- Warehouse
- Outdoor Area/Leisure Area

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## Schedule of Accommodation

Table 4.1: Source; Researcher's field survey

SPACE	NO/CAPACITY	SIZE (m <sup>2</sup> )
<b>Recreation/Entertainment</b>		
Cinema halls	2 (205)	410
Office	2 (14)	28
Drinks and Snacks	2 (9)	18
Ticket Room	2 (18)	36
Cinema Control and Projector Room	61	61
<b>Game arcade and Bowling Alley</b>		
Ticket Unit	8	8
Drink and Snacks	8	8
Open Office	15	15
Staff Lounge	18	18
Storage	8	8
Bowling Alley	116	116
Fitness Centre (Gym and Spa)	152	152
Changing Room	11 (2)	22
Toilets	2 (2)	4
<b>Commercial</b>		
<b>Ceci Anchor Store</b>		
Security Post	10 (2)	20
Payment Unit	19 (2)	38
Office	14 (2)	28

Stock Room	76 (4)	304
Sea food Unit	22	22
Bakery Unit	22	22
Fast Food Unit	22	22
Changing Room	13 (2)	26
Toilet	3 (4)	12
<b>Retail shops A</b>		244
<b>Retail shops B</b>		784
<b>Retail shops C</b>		4125
<b>Light Anchor Store</b>		1240
<b>Restaurants</b>		
Dinning	112 (2)	124
Kitchen	42 (2)	84
Cold Store	3 (2)	6
Office	15 (2)	30
Dry Store	5 (2)	10
Toilets	2 (4)	8
Servery	10 (2)	20
<b>Banks</b>		
ATM Gallery	11 (2)	22
Office	12 (2)	24
Toilet	2 (2)	4
Cashier's seat	11	11
Hall	91	91

Vault	6	6
<b>Other Ancillary Facilities</b>		
Parking Lots (Cars)	536 (12)	6432
Parking Lots (Heavy Trucks)	30 (54)	1620
Convenience	3 (48)	144
Cleaner's room	9 (6)	54
Duct	5 (6)	30
Changing room	10 (4)	40
Toilet (Changing room)	4 (2)	8
Warehouse	2 (225)	450
Store	15 (2)	30

#### 4.4.3 Construction Methods and Materials

Sustainable materials were used in the design of this project. Factors that influenced their choice are;

- Aesthetics
- Durability
- Climatic condition
- Availability in Akure
- Their functionality
- Regulations and bye-laws

Substructure; reinforced concrete

Walls; Hydraform bricks for external walls

MDF wood and glass for internal partition

Interior walls painted with Airlite paint to protect against growth of mold and microbes, and eliminates germs

Floor; parquet wood flooring, piezoelectric floors, clay tiles

Door: wooden panel doors, steel doors, glass doors

Roof; long span aluminium roofing sheet covered with solar panels. Glass with steel roof support for atrium

Ceiling; wooden ceiling finished with Airlite paint

#### **4.4.4 Building Services**

Duct are intended close to areas that need a lot of plumbing and energy throughout the building. The service circulation surrounding the building will double as an open duct for pipes and wiring. The ducts are wide enough to be accessible from the back in case an area needs fixing.

Some deep areas e.g., toilets will still need central air conditioning and artificial lighting. Internal spaces like the retail store, staff area etc will need artificial air conditioning and lighting too. The circulation space will be ventilated by stack effect and lit by natural light coming through the atriums.

Fire extinguishers, sand pots and fire space routes and stairs are placed strategically throughout the building in the case of a fire emergency. A dedicated fire safety space is centrally place on each floor close to a duct to fight fire outbreak too.

## Chapter Five

### Conclusion and Recommendation

#### 5.1 Conclusion

Circulation is crucial in a shopping mall, encompassing everything from the entrance and walkways to the arrangement of spaces. Ensuring shoppers' comfort relies on effective signage and navigational ease. External and internal circulation hold equal significance. The way shoppers move from the parking lot and main entrance to the shopping mall entrance is determined by the external circulation. The mall's architectural success and the frequency of shoppers returning to the mall are affected by how easily this navigation occurs. This is the reason why the majority of shopping malls design their parking lots at the front of the shopping mall entrances. The parking lots serve as strategic points where people can take breaks and find resting benches and waste bins. After observing how shoppers behave in retail settings and researching existing studies, I have determined that while many factors can impact the overall success of a shopping mall, there are certain considerations architects should always remember when designing the mall and planning the layout of individual stores. These include:

#### 5.2 Recommendation

1. It is more sensible and effective for the circulation in shopping centers to align with the natural movement of shoppers, rather than forcing pedestrians through a specific design. Generally, shopping centers that do not prioritize this approach are found to be less convenient and successful.
2. The mall's layout should be straightforward, comprehensible, and inviting, as shoppers who feel lost or uncomfortable tend to spend less money.
3. The design of the corridors and common areas should allow people to easily see the surrounding stores and the products they have on display, which will attract more customers

4. The areas such as the entrance/exit and parking spots have a high density of people and are frequently occupied.
5. Problems can occur as a result of large crowds, which can then decrease the likelihood of people visiting again. Therefore, it is important to carefully plan these spaces.
6. Shopping malls are designed to accommodate individuals of all ages, genders, and cultural backgrounds, as they attract a diverse range of people.

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## Reference

- Abazari, Y. & Kazemi, A. (2005) Theoretical approaches to shopping: From sociology to studies, *Journal of Social Studies*, 25, 167-195.
- Erçetin B., E. (2010), Investigating Shopping Malls in Turkey and Developing a Shopping Mall Project in Van Province, Master Thesis, Istanbul Technical University, Institute of Science, Istanbul.
- Janis K. (2019). Accessible routes and other pedestrian ways. Stepping thru accessibility. Janis Kent FAIA, CASp, Architect.
- Jorge C., Ester H. (2017) "The Suitability of Sustainable Retrofitting Means for Shopping Malls, In an Environmental and Urban Background. A Resume of The Methodology" *UPLanD – Journal of Urban Planning, Landscape & environmental Design*, 2(2), 85-96.
- Knorr (2009); Knorr Architecture Blog, Retrieved from <http://knorrarchitecture.blogspot.com/2009/07/circulation.html>
- Lan Fulgar, (2022), Accessibility in architecture and the role of social awareness, 2P Lee Gardens Building shaw Boulevard, Mandaluyong City, Philippines.
- Poldma T. et al. (2014) "Understanding people's needs in commercial public space: About accessibility and lived experience in social settings". *ALTER, European journal on disability research*. Vol 8. Pp. 206-216.
- The International Council of Shopping Centres. (2004) *ICSC Shopping Centre Definitions*. New York: The International Council of Shopping Centres
- Ward, K., Mitchell, J., & Price, P. (2007). "Occupation-based practice and its relationship to social and occupational participation in adults with spinal cord injury". *OTJR: Occupation, Participation and Health*, 27(4), 146–149.

And Security In A Shopping Environment Through Architectural Measures: A Case Study Of The  
Congested Onitsha Main Market, Nnamdi Azikiwe University, Awka,  
**Article** · November 2021

Ashrae. (1989). Ashrae Handbook. USA: Fundamentals SI Edition.

Carol, E. (2010). Writing Research Papers. New York: McGraw Hill.

Çalgın Karbeyaz, G., “Acoustic Comfort in Shopping Centre”, Unpublished Ms. Degree Thesis,  
Yıldız Technical University Institute of Science, Istanbul, pp. 13-21, (2017).  
<https://tez.yok.gov.tr/UlusalTezMerkezi/> Last Accessed: 11.05.2021

De chiara, j., & Callendar. (1990). Time Savers Standards for Building Types. (3rd edition),  
NewYork: McGraw-Hill Publishing.

Donald, W., Michael, J., John, H. (1997). Time Saver Standards for Architectural Design Data.  
(7th Edition), USA: McGraw-Hill, Inc.

European Journal of Scientific Research. (2009). Thermal Comfort in Naturally Ventilated Office  
under Varied Opening Arrangements. Malaysia: Euro Journals Publishing, Inc. Vol. 26.  
Pp. 260-276.

Frontier Market Intelligence. (2009). Trade Invest Nigeria. Interview by Prakash Pantham, a  
director of the company about the planned expansion and the future of modern shopping  
centres in Nigeria. (Thu, 28 May 2009 06:58)

F.O. Uzuegbunam. (2012). Sustainable Development for Traditional Market-Places in South-  
Eastern Nigeria. Journal of Environmental Management and Safety. Vol.3, No.1. Pp139 –  
158.

GDA Creative Solutions. (1999). Car Park and Landscape Design. England: Belmont Press.

- Geç, Ş., “A Study for the Urbanization Criteria Which Effects the Development of Shopping Centres in Turkey”, Unpublished Ms. Degree Thesis, Istanbul Technical University Institute of Science, Istanbul, pp. 13-19, (2008).  
<https://polen.itu.edu.tr/bitstream/11527/1588/1/8794.pdf> Last Accessed: 10.05.2021
- Ikenna Michael Onuorah , Paschal Uchechukwu Mbah, Okafor Calistus, 2021. Enhancing Circulation
- Joseph & Michael .J. C. (2000). Time Saver Standards for Building Types, (5th edition). New York: McGraw-Hill Publishing.
- Marvin, D., Goodman. (2002). Vehicular Circulation. Puerto Rico: MG Associates.
- Michael, F. (1999). Renovating Mall Security, the Social Importance of Shopping.
- Muswellbrook Shire Development Control Plan. (2010). Car Parking and Access. USA
- Terece, T., “The Investigation of Physical Comfort Criteria’s in Accordance with the Universal Design Principles at Shopping Malls: A Broad Programmed Shopping Mall Experience” Unpublished Ph. Degree Thesis, Fatih Sultan Mehmet Foundation University Graduate Education Institute, Istanbul, pp. 5-59, (2019). <https://tez.yok.gov.tr/UlusalTezMerkezi/> Last Accessed: 10.01.2021
- Verdil, A., “Transformation of Space-Behaviour Relation: Dissertation of Shopping Centres Using the Method of Space Syntax”, Unpublished Ms. Degree Thesis, Istanbul Technical University Institute of Science, Istanbul, pp.3-38, (2007).  
<https://tez.yok.gov.tr/UlusalTezMerkezi/> Last Accessed: 15.03.2021
- Yıldırım, T. “A Comparative Study of the Change and Development Processes and the Design Criteria of the Shopping Malls In Istanbul”, Unpublished Ms. Degree Thesis, Istanbul Technical University Institute of Science, Istanbul, pp. 23-40, (2010).  
<https://tez.yok.gov.tr/UlusalTezMerkezi/> Last Accessed: 15.03.2021

**Appendix 1 Presentation Drawing**

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## Bio-Data

### A. Personal Data:

1. Full Name: ODOR Ogechukwu Emmanuel
2. Address: 28, Ilaje Street, Ijapo Estate, Akure, Ondo State,  
Nigeria
3. Email Address: [ogyson@yahoo.com](mailto:ogyson@yahoo.com)
4. Phone Number: 08034720128
5. Date of Birth: 29th March, 1973
6. Place of Birth: Etiti, Imo State
7. Nationality: Nigerian
8. Marital Status: Married
9. Name and Address of Next of Kin: Mrs Odor Ogechukwu Cecilia

### B. Educational Background:

1. Educational Institution Attended with Dates and Qualification:

Qualification	Institution	Date
Msc. Architecture	Lead City University, Ibadan, Oyo State.	2021 - Date
B.Sc. Architecture	Lead City University, Ibadan, Oyo State.	2018 - 2021
Post Graduate Diploma (Architecture)	Federal University of Technology, Akure (FUTA), Ondo State.	2008 – 2010
Higher National Diploma (HND), Architecture	Yaba College of Technology, Yaba, Lagos State.	1997 - 1999
National Diploma (HND), Architecture	Yaba College of Technology, Yaba, Lagos State.	1993 – 1995
Secondary School Leaving Certificate	St. Augustine's Grammar School Nkwerre, Imo State.	1986 - 1991
Primary School	National Primary Nkwerre, Imo State	1980 - 1986

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## Leaving Certificate

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### C. Awards and Fellowships:

- Man of the year Award by the then Ondo state Governor (Dr. Olusegun Mimiko)
- Man of the year Award by Breez FM
- Ondo state Investor/Entrepreneur of the year by Ondo state Government
- Philanthropist of the year by All saints Anglican church Ijomu, Akure, Ondo State  
(Endorsed by the Lord Bishop of Akure Diocese)
- Award of excellence by National Association of Nigerian Students
- Distinguished Customer of Award by Fidelity Bank Plc.
- Knight of St Christopher by Church of Nigeria, Anglican Communion

### D. Work Experience:

- **Retail Stores Owner (CECI MEGA PLAZA)** 2008 till date
  - Oversee the day-to-day operations of the business
  - Develop and communicate organizational strategy
- **CEO Ogyson Nigeria Limited** 2005 till date  
(Indigenous registered construction company)

### E. E-Publication:

#### 1. An Assessment of Circulation in a Public Place Design, Case Study of Shopping Mall in Ibadan, Oyo State, Nigeria.

Authors – Ogechukwu Emmanuel ODOR<sup>1</sup>, Babajide Sunday ASEYAN<sup>2</sup>  
12-Department Author E-mail Address: ogyson@yahoo.com T: 08034720128

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Signature

.....  
Date

### The University Compliance Certification

This is to certify that the Thesis by Odor Ogechukwu Emmanuel with the matriculation number LCU/PG/002735 in the Department of Architecture, Faculty of Environmental Design and Management, Lead City University, Ibadan is in full compliance with University format and style of thesis.

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Signature

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Date

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