

ARCHITECTURAL DESIGN APPROACHES FOR EFFECTIVE CROWD CONTROL IN MULTIPLEXES AND ENTERTAINMENT HUBS, VICTORIA ISLAND

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Abstract

Since the dawn of man, entertainment has come shortly after food, water, and shelter on our list of priorities. Architecture has historically complemented entertainment and this connection has produced many buildings, both ancient and modern, designed to house large audiences. This research focuses on optimizing crowd control through effective circulation and layout in a Multiplex and Entertainment Centre in Victoria Island, Lagos State, Nigeria. With over 17 million residents, Lagos, known as the “city of entertainment” faces significant crowd management challenges. As a hub for entertainment, strategic space organization becomes essential for ensuring smooth movement within and around these facilities. Data for this project was collected using qualitative methods, including case studies and participant observation at various multiplexes in Nigeria, alongside secondary sources like textbooks and journals. Key findings indicate the presence of a conventional crowd type and propose design solutions such as: strategic planning of vehicular and pedestrian traffic, separate entrance and exit paths, unobstructed pathways, well-positioned emergency exits, and the adoption of a horizontal multi-story composition. These findings contribute to the growing body of knowledge on effective crowd management and circulation in public spaces, providing insights for future architectural designs in Lagos State and beyond.

Keywords: crowd control, circulation, multiplex, entertainment centre, Lagos, architectural design

1.0 INTRODUCTION

Panic used to be blamed for crushes at large events but experts now believe that poor building design and bad planning are the real culprits (Cash, 2022). It is no secret that men have prioritized entertainment; in our list of priorities, it ranks just after food, water, and shelter. According to Maslow's hierarchy of needs, the top three levels—esteem, love and belonging, and self-actualization—can be shaped by our entertainment experiences. Architecture has historically complemented entertainment, take the Roman Colosseum, for example, an architectural marvel built for the sole purpose of entertainment, and now recognized as one of the Seven Wonders of the World. This connection between architecture and entertainment has continued throughout history, with many buildings, both ancient and modern, designed to captivate audiences. However, there's a critical issue that comes into play when we think about architecture and entertainment: crowd management. These venues are meant to draw in large crowds, but

if there aren't proper crowd control measures in place, it can lead to chaos, delays, and even disasters that put lives at risk (Lee & Hughes, 2006).

Crowd management goes beyond simply directing or controlling people; it is a strategic and multifaceted process aimed at ensuring safety, order, and efficiency (Hema, et al., 2025).

Architecture profoundly influences human behavior, shaping how we think, feel, and interact with our environment. From the spatial layout to the choice of materials, every element of architectural design can significantly affect our experiences and actions (Martins, 2024). Poorly designed spaces can create confusion and a sense of being lost, hampering effective crowd movement (Sampath, 2020). Crowd disasters have unfortunately become commonplace in various parts of the world. For instance, in 2022, over 39 people were killed, with many others injured, during a stampede at polo club in Port Harcourt, Nigeria (Okonkwo, 2022). As mass gatherings and events continue to rise globally, crowd safety has become an increasingly pressing concern. Ensuring the safety of large crowds presents a complex challenge, yet there remains a lack of widely accepted knowledge regarding effective accident prevention strategies (Haghani et al, 2023)

2.0 LITERATURE REVIEW:

2.1 CROWD CONTROL STRATEGIES IN A MULTIPLEX

This review examines existing literature on crowd control strategies, specifically focusing on their application in multiplexes and entertainment centers. By critically analyzing crowd dynamics in this environment, we explore the types of crowds attracted to these facilities, the concept of crowd control, and the key movement patterns characteristic of these crowd types. In conclusion, this review will address architectural design strategies that can enhance crowd control within this facility.

2.1.1 Understanding the Concept of a Multiplex and Entertainment Centre

To fully understand the general literature, it's essential to grasp the concept of a multiplex and entertainment centre. A multiplex and entertainment centre is a spacious, multifunctional facility designed to host multiple cinemas, typically featuring between six to twelve screens. In addition to movie theatres, these centres often include a variety of recreational amenities such as restaurants, bars, gaming arcades, and sometimes retail shops. Multiplexes and entertainment centres complement each other; both aimed at bringing people together for fun and enjoyment. The goal is to create a one-stop location for families and individuals to gather and have a great time.

2.1.2 Crowd Dynamics within a Multiplex and Entertainment Centre

Crowd dynamics within a multiplex and entertainment center involve complex interactions influenced by various factors, including the spatial layout, movement patterns, and social behavior.

I. Type of Crowd in a Multiplex and Entertainment Centre

A conventional crowd is a collection of people who gather for a specific purpose. They might be attending a movie, a play, a concert, or a lecture (Minnesota, 2016). In this case the sole purpose could be to see a movie, dine at a restaurant, shop or visit the arcade. This crowd doesn't show true collective behaviour.

Instead, their actions tend to be quite traditional and organized, which makes them different from what we typically think of as a chaotic or spontaneous crowd (Goose, 1992). It's an interesting perspective that challenges our usual understanding of how groups behave in public spaces.

II. The Concept of Crowd Control

(Simpson, 2000) Introduced an interesting concept about how crowds come together, which he broke down into three main phases: assembling, temporary gathering, and dispersing. He described crowd formation as a journey with a clear beginning, middle, and end.

During the assembly phase, people start making their way from different locations to a specific space within a certain timeframe. This phase can be affected by various factors, like how many routes are available for access, the clarity of signage and way finding. The outcome of the assembly phase leads to the temporary gathering phase. Similarly, (Benjamin, 2000) points out that a temporary gathering is when people come together in a specific place to engage in various activities, both on their own and as part of a group.

The last part of this phase process is dispersal, which involves relocating individuals from one location to one or more alternative destinations. Dispersal might take place on a regular, emergency, or coercive basis. (Simpson, 2000). Dispersal driven by routine happens when an event takes place over a specific duration in a completely normal setting like at the end of a movie. Conversely, emergency dispersal occurs when people leave an area due to an unexpected disaster, such as a fire, explosion, or flood. When security officers' resort to using force to relocate persons or groups that refuse to disperse after an event, this is known as coercion dispersion (Hyginus, Dr Warebi, & Dr Chizzy, 2022).

III. Key Movement Patterns of Crowds in a Multiplex and Entertainment Centre

No single rule is known for classifying the space of multiplexes. However, in general, the space is divided into theatre, service area, and management space (Yun, 2003) The theatre is the most important space in the multiplex and is where audiences watch movies; thus, the allocation of the theatre determines the composition of other spaces. Despite the lack of a uniform standard, the **service area** in multiplexes is generally divided into public area, resting area, and entertainment area. Moreover, each area can be further segmented into individual facilities. (Park & Ham, 2016)

The circulation system of multiplexes can be analyzed by considering the process in which the audience enters the hall, passes the lobby area, enters the theatre, and then exits from it. The total space of this system can be divided into three. The first is the hall where entrance and exit occurs. The second is the **lobby**, which contains the waiting, lounge, entertainment areas and service areas. The third is the theatre where movie watching takes place. The analysis can then be conducted by adding physical or virtual entrance and exit paths that connect each element. Moreover, the compositional type of moving paths can be diversified according to the accessibility of entrance and exit from the multiplex, vertical accessibility throughout the theatre, and the types of entrance and exit (Park & Ham, 2016)

The concept of crowd as introduced by Simpson, can be related to this movement circulation paths in a multiplex, therefore forming a movement pattern.

The Assembly phase takes place in the concourse, where individuals gather as they arrive. The concourse serves as a transition hub, facilitating the initial coming together of the crowd. After assembling, they move to the lobby, specifically the box office and snack bar, to purchase tickets and refreshments. Here, temporary gathering occurs, once tickets are acquired, the crowd disperses into their respective cinema halls, where they gather again to enjoy a movie. At the end of the movie, the crowd exits from the various cinema halls and reconvenes in the lobby area of the theatre section (Dispersal). Moreover, temporary gatherings can also happen in smaller venues, such as food courts and arcades, before patrons leave the entertainment centre.

2.1.3 Architectural Design Strategies for Crowd Control in a Multiplex and Entertainment Centre

I Crowd Control in the Car Park

Crowd control starts the moment you set foot at the facility, even before you actually enter the building. The Multiplex and Entertainment Centre is a big facility that can host a lot of visitors, which means it needs a spacious parking area. We all know that parking lots can sometimes lead to traffic headaches, especially when cars and pedestrians are trying to navigate the same space. To tackle this issue, the plan includes creating separate pathways for vehicles and pedestrians. This way, we can avoid any potential conflicts, making it easier and safer for both foot traffic and vehicles to move around. By keeping these paths distinct, we can ensure a smoother flow and a more enjoyable experience for everyone at the site.

II Crowd Control to the Theatre

To ensure effective crowd control, audiences are first guided into the hall before proceeding to the lobby. This helps manage the number of people entering the lobby at any given time. The lobby, ideally designed in a linear fashion, directs the flow of users past entertainment options like retail outlets and arcades, creating a "pass-by space" relationship to minimize congestion. Additionally, the lobby should feature diversions to more entertainment facilities, acting as a magnet store at the end of these routes. The journey from the lobby to the theatre should be an exploration of engaging activities, culminating in the theatre with the box office serving as a focal point. The separation of the box office and snack bar is advised as it is one of the major causes of foot traffic. The theatre should have distinct entrance and exit paths to reduce chaos and overcrowding during and after show times (Park & Ham, 2016). For enhanced crowd control, the exit route from the theatre should be closely connected to the parking area. Emergency exits should be made available in all routes and spaces.

III The Use of Separate Entrance and Exit Circulation Path

The separate entrance and exit type is frequently observed when the theatre covers two stories and is large in scale (Park & Ham, 2016) the theatre's separate entrances and exits help make things less chaotic and crowded during and after show times. In this path type, the user enters and exits the theatre from different levels. The lobby is designed to provide a range of services that not only cater to the audience's needs but also boost the theatre's profitability. These could be retail outlets, arcades and their likes. However, the efficiency of space and facility usage can be low, particularly in the exit area. (Park & Ham, 2016).

3.0 METHODOLOGY

The data for this project is collected through qualitative research method which includes, case study research, participant observation at various Multiplex and Entertainment Facilities in Nigeria, as well as theoretical examination of case studies outside Nigeria. The research is also built on various secondary sources such as textbooks, mass media, journals and official sites. This approach synthesizes data from:

3.1 Design Documentation

Architectural drawings, zoning diagrams, and conceptual materials from various multiplex and entertainment centres were analysed to examine:

- I. Spatial Organization
- II. Multiplex Composition Types
- III. Multiplex Circulation Paths
- IV. Crowd Control Strategies

This study seeks to clarify how these elements interact and contribute to the overall design and functionality of these facilities.

Comparative Case Studies

Five multiplex and entertainment centers were analyzed to identify circulation strategies. Three of these are international case studies, while two are local. The selected case studies include:

International Case Studies

- I. Busan Cinema Center (Busan, South Korea)
- II. Etoile Lilas Cinema (Paris, France)
- III. Khan Shatyr Centre (Astana, Kazakhstan)

Local Case Studies

- IV. Genesis Cinema Centre (Port Harcourt, Nigeria)
- V. Ceddi Cinema Plaza (Abuja, Nigeria)

3.2 Secondary Observations

The findings from existing studies on crowd behavior in multiplexes were synthesized to predict expected responses in comparable environments. This methodology is exploratory, emphasizing the development of design strategies rather than measuring specific outcomes.

4.0 FINDINGS AND DISCUSSION

4.1 Circulation Strategies from Comparative Case Studies

Busan Cinema Center (Busan, South Korea) I. Spatial Organization

The spaces are divided into three zones, the **Double Cone** serves as the landmark entrance to the Busan Cinema Centre, connecting **Cinema Mountain** to **BIFF Hill**. The ground level features a public café with outdoor seating, while the upper level includes a restaurant, bar, and lounge with views of the park and river. Cinema Mountain, a multipurpose entertainment centre, houses a 1,000-seat multifunctional theatre and a three-screen multiplex (one 400-seat and two 200-seat cinemas), each with separate entrances. The

Urban Valley consists of a flexible plaza and stepped tribunes on BIFF Hill, seating 4,000 for outdoor screenings under a monumental roof. The Memorial Court, a grand entryway to Cinema Mountain, serves as a multifunctional event space. BIFF Hill includes the outdoor cinema seating area, concourse, convention hall, BIFF centre, BIFF offices, and visual media centre (Coophimmelb(l)au, 2012) **II. Multiplex**

Composition Types

The multiplex is composed using a horizontal multi-storied composition, this composition type is observed in cases where multiplexes belong to a part of a multi-purpose building and are located on a single floor, the cinemas are located on the top floor and the lower floors are used for other purposes. The main lobby area is located in the lower level, and the entrance and exit paths are designed in the upper level.

III. Multiplex Circulation Path

The design adopted a separate entrance and exit type of circulation hence, entrance and exit paths from the theatre are separated, minimizing confusion during transitions before and after the show. In this circulation type, visitors enter through the main entrance and proceed to the box office situated within the 'cinema mountain.' As they ascend to the top floor, they pass through various levels that function as a vertical lobby, hosting additional activities that support the cinema. Finally, they enter and exit the cinema through separate doors, ensuring a smooth experience.

IV. Crowd Control Strategies

Crowd control on the site was achieved by segregating pedestrian and vehicular traffic. Vehicles are directed to the basement, while pedestrians navigate the ground floor. The design concept focuses on creating a connection between open and closed spaces, which positively influences crowd management and minimizes the risk of stampedes due to the close relationship between indoor and outdoor areas. Also, the implementation of separate entrance and exit type of circulation enhances foot traffic, effectively reducing congestion.

Etoile Lilas Cinema (Paris, France)

I. Spatial Organization

The building has been divided into two volumes (cinema and shops) and a large terrace devoted to the art of film hangs over the volume which accommodates the shops. Screens 5, 6 and 7 are sat on top of the shopping volume. Screen 3 is dug into the entrance hall. Screens 1, 2 and 4 are superimposed on the hall, lending the building a monumental quality. The entrance hall, on the ground floor, provides an extension of the square through the building to the Avenue du Docteur Gley. The three screens in the superstructure are suspended above this space, stacked in order of increasing capacity (reverse pyramid), to free up a space for visitors to walk through. **II. Multiplex Composition Types**

The project adopted the Vertical multi-storey composition hence, the cross section of the theatre is planned over more than two levels, the entrance and exit paths are also located in different levels. This type allows the easier control of the entrance and exit paths

III. Multiplex Circulation Path

The multiplex uses the separate entrance and exit type of circulation, the cinema halls exit staircases lead mainly to the neighbourhood road, and the Avenue du Docteur Gley in the open air, though sheltered. The terrace is connected to the entrance hall by two staircases and to screens 1 and 2.

IV. Crowd Control Strategies

The introduction of the separate entrance and exit type of circulation makes it easier to control foot traffic as the crowd dispatches in separate exits and new users enter from different entrances. The exit leads to the neighbourhood road which further empties the crowd into the streets. This is a functional crowd control strategy.

Khan Shatyr Centre (Astana, Kazakhstan)

I. Spatial Organization

The layout of the Spaces has been meticulously designed to facilitate the smooth operation of activities while prioritizing the safety of all individuals present. To effectively manage crowd dynamics and reduce the potential for stampedes, the areas are strategically arranged in a vertical manner according to anticipated visitor numbers. For example, the ground floor accommodates high-traffic locations such as entrance halls and food courts, which naturally attract large gatherings. In contrast, the upper levels are designated for retail shops and children's play areas and arcades, creating a more tranquil environment suitable for families. Ascending to the higher levels, one encounters cinemas and beach areas, which are strategically positioned to enhance foot traffic. Moreover, the convenience of having the cinema halls and box office located on the same level significantly simplifies the movie-going experience for patrons, ensuring that they can enjoy their cinematic experience with ease and efficiency.

II. Multiplex Composition Types

The multiplex adopted a horizontal single-storied composition which is implemented in cases where the multiplex is designed as a part of a multi-purpose building. It is characterised thus; the cinema halls are all located on one floor

III. Multiplex Circulation Path

The project uses a vertical circulation type. The main circulation components are escalators and elevators. The multiplex adopted a direct- exit circulation path, where the audience can directly exit to the hall or entering space without passing the lobby area.

IV. Crowd Control Strategies

Crowd control strategy was included in various ways; Landscape: the presence of a vista which frames the building and makes it a focal point & creates a vertical flow, the radial composition of spaces makes crowd control easier as it mostly deals with vertical movement, all spaces are connected to a void central point making it easier to find your way.

Genesis Cinema Centre (Port Harcourt, Nigeria)

I. Spatial Organization

Upon entering the ground floor, users encounter a dedicated box office where cinema enthusiasts may purchase tickets, alongside a selection of food courts that present an array of culinary delights. Ascending to the first floor, one can engage in the excitement of cinema halls, partake in arcade challenges with friends, or explore various retail outlets. The upper level elevates the entertainment experience further, featuring a nightclub and bar, ideal for individuals seeking relaxation after a demanding day. In subsequent years, the Centre underwent expansion, introducing a new building that houses three additional cinema halls, an updated box office, a comfortable waiting area, and pharmacies for added convenience.

II. Multiplex Composition Types

The multiplex adopted a horizontal single-storied composition which is frequently observed in cases where the multiplex belongs to a part of a multi-purpose building. In this type, the practical spaces required for actual movie watching are located on one floor.

III. Multiplex Circulation Path

The centre uses a unified moving path type and is the simplest circulation system where all spaces, including ticket areas, entrances, waiting spaces, and cinema halls, share the same path. It connects these spaces using a linear lobby, therefore directing all foot paths to the lobby before and after the movie; the other comes from the existing land.

IV. Crowd Control Strategies

Separating pedestrian and vehicle traffic is an effective crowd control strategy, as it helps to minimize congestion. Additionally, having a separate cinema located in another area of the site aids in managing crowds, ensuring that no single building becomes overly crowded. There is visual continuity between the ground and first floor.

Ceddi Cinema Plaza (Abuja, Nigeria)

I. Spatial Organization

The multiplex comprises 4 stories, retail outlets on the ground floor, a lifestyle centre on the first floor, the cinemas and box office on the third floor and a night club on the last floor. The multiplex also features pharmacies, arcades, restaurants, bookshops and much more. These floors are connected through a voided entrance hall and an elevator is placed in the middle to present the whole view.

II. Multiplex Composition Types

The multiplex adopted a horizontal single-storied composition which is frequently observed in cases where the multiplex belongs to a part of a multi-purpose building. In this type, the practical spaces required for actual movie watching are located on one floor.

III. Multiplex Circulation Path

The centre uses a unified moving path type and is the simplest circulation system where all spaces, including ticket areas, entrances, waiting spaces, and cinema halls, share the same path. It connects these

spaces using a linear lobby, therefore directing all foot paths to the lobby before and after the movie; the other comes from the existing land. The multiplex uses a vertical circulation system with elevators and stairs as the main circulation system.

IV. Crowd Control Strategies

Separating pedestrian and vehicle traffic is an effective crowd control strategy, as it helps to minimize congestion. Additionally, visual continuity between all spaces creates a mental mustard point in emergency situations.

5.0 CONCLUSION

As entertainment venues continue to attract larger crowds, the importance of effective crowd management cannot be overstated. Lagos, with its population of approximately 21 million, is one of the fastest-growing cities in the world, leading to an increasing demand for safe and efficient public spaces. This burgeoning population underscores the need for robust crowd control measures in facilities across the city.

The study highlights that thoughtful architectural design can transform chaos into flow, promoting safety, efficiency, and enjoyment in multiplexes and entertainment centers. Given the density of Lagos, where mass gatherings can quickly escalate into overwhelming situations, prioritizing crowd control strategies becomes crucial. By incorporating innovative design elements that facilitate smooth movement and enhance safety, we can create spaces that not only entertain but also protect the well-being of all visitors. As we strive to improve the infrastructure of Lagos, let us ensure that our architectural marvels reflect a commitment to safety, community engagement, and the cultural vibrancy that defines this dynamic city.

6.0 RECOMMENDATIONS

1. **Circulation on site:** Effective circulation begins at the site, making careful planning essential. The optimal solution for managing site traffic is to separate pedestrian and vehicular pathways. This approach, as illustrated in the analyzed case studies, minimizes conflicts and enhances safety. In emergency situations, mixed traffic can lead to chaos, with both pedestrians and vehicles attempting to escape simultaneously, often driven by adrenaline rather than a clear strategy. By ensuring distinct pathways for each group, we can facilitate a safer and more organized flow, reducing the risk of accidents and panic during critical moments. Embed symbolic cues in functional elements—floors, lights, textures, and volumes should all support wayfinding.
2. **Flexible Circulation Paths:** Implementing flexible circulation systems that allow for separate entrance and exit routes will help manage crowd flow effectively. This design can alleviate congestion during peak times and enhance the overall user experience.
3. **Engaging Spaces:** The conventional crowd is known for its organized and predictable behaviour, to capitalize on this characteristic, spaces that are closely related should be placed in close proximity in order to facilitate better movement. For instance, if someone is visiting an arcade, they might also encounter a toy shop and a children's play area. Placing the box office and snack bar on different floors as magnet points

can help manage crowd flow. Serving snacks often leads to delays in queues, so separating these areas will reduce congestion on the concourse and improve overall movement.

4. **Emergency Preparedness:** Incorporating clear signage and emergency exits throughout the multiplex is vital. The affiliation or normative theory of crowd behaviour in emergencies highlights an interesting aspect of human behaviour during emergencies. It suggests that when faced with a crisis, people naturally gravitate towards familiar places and routes, preferring to leave by a familiar route, namely the way they came in, as opposed to an emergency exit (Mawson, 2005).

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