

THE INFLUENCE OF VISIBILITY ON PERSONAL SPACE CREATION IN URBAN PUBLIC SPACES: A CASE STUDY OF THE ARCADE AT INDEPENDENCE SQUARE

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ABSTRACT

Urban open public spaces play an important role in supporting social interaction, recreation, and psychological well-being within dense urban environments. While much of the existing literature emphasizes the role of public spaces in encouraging social interaction and ensuring safety through visibility, relatively limited attention has been given to how visibility can also support personal space creation in urban public spaces. The research focuses on the Independence Square Monument in Colombo as a case study. A mixed-method approach was adopted, combining spatial analysis and behavioural observation. For the spatial analysis, two parameters were used to examine visibility: overall visibility and point visibility. Under behavioural analysis, users' spatial choices were examined using two parameters: proximity and movement patterns. Visibility conditions were analysed using Visibility Graph Analysis (VGA) and point isovist mapping through DepthMapX software, while user spatial behaviour was documented through observations and photographic documentation. The findings indicate that users tend to select locations where visibility can be partially controlled, allowing them to balance exposure to the public environment while maintaining personal space. The study concludes that managing visibility through architectural and landscape elements such as columns, edges, and shaded zones can enhance privacy in urban public spaces without compromising safety or social interaction.

Keywords: *Arcade Independence Square; Privacy; Urban Open Public Spaces; User Behaviour; Visibility.*

1. INTRODUCTION

In contemporary society, people's lives are often shaped by demanding schedules and repetitive daily routines. For many, each day follows a predictable pattern of commuting from home to work and back again. Homes and workplaces are mostly designed to meet functional needs, leaving little room for relaxation or leisure (Maslow, 1970). Consequently, the need for accessible open spaces in urban settings has become increasingly significant.

Urban open public spaces provide opportunities for relaxation, social interaction, and temporary escape from daily pressures. However, the way people use these spaces is not random. Users often select specific locations within a space based on environmental and

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spatial conditions that allow them to feel comfortable while maintaining an appropriate level of personal space.

Much of the existing literature on public spaces emphasizes their role in promoting social interaction and community life. Within these discussions, visibility is often considered primarily as a factor that enhances safety. However, an equally important dimension of public life is the human need for privacy. Most foundational studies on public space behaviour were conducted during the 20th century, when social life was largely shaped by face-to-face interactions and limited technological influence. In contrast, the 21st century has introduced significant changes in the ways people experience and value public spaces. With the rapid growth of digital devices, social media, and virtual networks, individuals increasingly seek moments of personal reflection, temporary withdrawal, and calm within urban environments. In this context, managed visibility becomes an important spatial condition, enabling users to balance exposure to the public realm while maintaining a sense of personal space and privacy.

1.1 AIM AND OBJECTIVES

The main aim of this study is to examine visibility levels in different spatial conditions and identify the personal space adopted by users in Sri Lankan urban open public spaces, to understand how effectively existing public space designs support the maintenance of personal space while maintaining balanced social interaction.

To achieve this aim, the research is guided by the following objectives:

- To identify the current visibility level of urban public spaces that influence users' personal space.
- To understand users' spatial choices in urban public spaces, particularly how they maintain personal space.
- To derive recommendations for creating effective open public spaces that balance personal space creation, safety, and social interaction within the Sri Lankan urban context.

1.2 SCOPE AND LIMITATIONS

The scope of this study is to analyse how visibility within the built environment influences the creation of personal space in urban public spaces.

The study is limited to a single case study, which may restrict the generalizability of its findings to other contexts. Technological or digital aspects of privacy, such as CCTV or electronic sensors, were not examined in this research. The user behaviour across different seasons or during large public events is also beyond the scope of this research. Emotional states or individual health-related factors are not considered within the boundaries of this research.

2. LITERATURE REVIEW

2.1 PRIVACY AS A DYNAMIC PROCESS

Privacy is a complex concept that has been defined in multiple ways, ranging from legal to normative interpretations, each revealing different dimensions of the concept. Its theoretical foundations draw from philosophical, legal, and sociological perspectives. These different approaches emerge from fundamental differences in how privacy is

understood across cultures. For example, most European legislation treats privacy as a fundamental human right that must be protected (Solove, 2008), whereas in American contexts, privacy is often considered a commodity that can be traded and negotiated against other benefits and risks (Solove, 2008).

A major contribution to the understanding of privacy was made by Alan F. Westin, who explored the philosophical, sociological, and legal aspects of privacy in modern society. Westin argued that privacy should not be understood as a static “right to be left alone,” but rather as a dynamic process of boundary regulation through which individuals manage their level of interaction with others (Westin, 1967).

According to Westin, individuals constantly move between four states of privacy:

- Solitude – being alone and free from observation
- Intimacy – privacy shared within close relationships
- Anonymity – being present in public without being personally identified
- Reserve – the psychological barrier individuals maintain to control personal information

These shifting states illustrate that privacy in everyday life is actively managed rather than fixed. Individuals constantly regulate their exposure to others in order to maintain control over their personal space and social interactions. Visibility is understood as the spatial condition that determines how much a user can see and be seen within the public space.

2.2 THE INDIVIDUAL DIMENSION OF PRIVACY

In public environments, the experience of privacy is closely connected to visibility and spatial perception. The way individuals position themselves in relation to others is often influenced by how visible or exposed they feel within a given environment.

The study of human spatial behaviour was significantly advanced by Edward T. Hall’s Proxemics Theory, which examines how people regulate interpersonal distance to maintain comfortable levels of interaction (Hall, 1966).

Table 1: Hall identified four primary zones of interpersonal distance

Zone	Distance	Description
Intimate Distance	0–18 inches	Reserved for close emotional relationships such as partners and family. Uninvited entry into this zone is perceived as highly intrusive.
Personal Distance	1.5–4 feet	Used in casual interactions with friends and relatives, allowing comfortable conversation while maintaining personal boundaries.
Social Distance	4–12 feet	Maintained during formal or casual social interactions with acquaintances, colleagues, or strangers.
Public Distance	12+ feet	Used in public settings such as lectures, performances, or observation, where interaction becomes more formal and impersonal.

These spatial zones demonstrate how individuals naturally regulate distance to maintain psychological comfort (Altman, 1975). These conditions of comfort then shape observable user behaviour and spatial choices, such as where they sit, how far they remain

from others, whether they occupy edge zones, and how they position themselves within the space.

2.3 PRIVACY OF INTIMATE GROUPS IN PUBLIC ENVIRONMENTS

Privacy is not limited to individuals alone. It also extends to intimate pairs and small social groups, such as couples, families, and close friends. These groups operate as collective social units whose members share emotional and behavioural boundaries.

The sociologist Erving Goffman provides an important theoretical perspective through his concept of civil inattention, which explains how people acknowledge the presence of others in public while avoiding intrusive engagement. It provides a foundation for understanding how interactions surrounding these groups unfold in public environments. Outsiders acknowledge the presence of others, including intimate groups, while avoiding intrusive engagement (Goffman, 1963).

- Focused interaction - individuals are jointly engaged in a shared activity, conversation, or task. Within intimate pairs or groups, this type of interaction strengthens internal cohesion and reinforces shared boundaries.
- Unfocused interaction - individuals are merely in one another's presence without active engagement. In public settings, intimate groups often engage primarily in focused interaction among themselves while maintaining unfocused interaction with surrounding strangers.

Mutual civil inattention allows strangers to avoid intruding upon the internal dynamics of a group while still acknowledging their presence in socially appropriate ways.

2.4 VISIBILITY AND PRIVACY IN URBAN PUBLIC SPACES

In compact residential environments, particularly among apartment dwellers, leisure time is frequently spent in outdoor public spaces such as parks. Therefore, these spaces play a critical role in supporting both social interaction and psychological well-being. Research highlights that urban parks contribute to emotional well-being, social connectedness, and the reduction of loneliness among urban residents (Cheung & Jim, 2019; Kim & Jin, 2018). At the same time, users often seek locations within parks that allow them to regulate their visibility and level of social exposure (Asadpour et al., 2022).

The concept of Defensible Space, introduced by Oscar Newman, provides insight into how spatial organization can support both security and privacy. Newman argued that environments function more effectively when they are structured through a clear hierarchy of spaces, ranging from public to semi-public to private. Although originally applied to residential environments, this concept can also be extended to public parks. Similar hierarchical spatial transitions, such as moving from a busy street to the central open area, and finally to more secluded peripheral "urban pockets," enable park users to select settings that match their desired level of privacy. These layered spatial conditions allow users to select environments that match their desired level of visibility, interaction, and privacy (Newman, 1972).

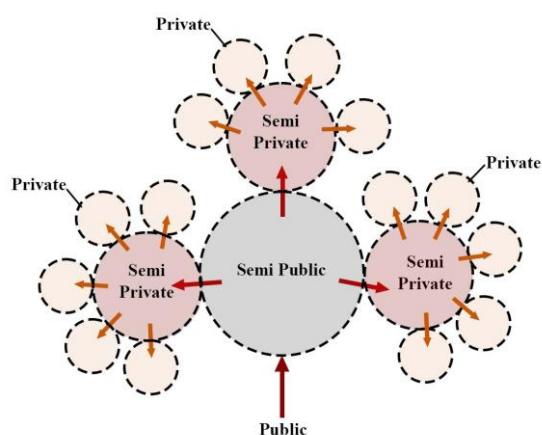


Figure 1: Hierarchy/ gradient of space from public to semi-public to private (Source: *Defensible Space; Crime Prevention Through Urban Design* by Oscar Newman (Redrawn by authors))

The literature review frames privacy in urban public spaces as a dynamic process of regulating exposure rather than achieving complete isolation. Within this process, visibility plays a significant role, as it shapes how users see others, how they are seen by others, and how comfortable they feel when occupying a particular space.

2.5 THEORETICAL FRAMEWORK

The theoretical framework of this study was arranged as follows. The framework is structured under two main aspects: the physical aspect and the social aspect.

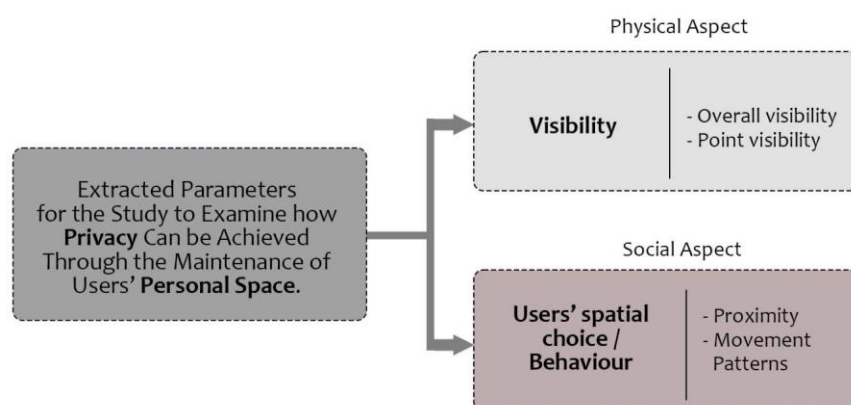


Figure 2: Theoretical Framework for the Study (Source: By Author)

3. METHODOLOGY

This study adopted a mixed-method approach combining spatial visibility analysis and behavioural observation. The methodology consisted of three main stages: first, analysing the visibility conditions of the selected nodes; second, recording user behaviour within the same spaces; and third, cross-analysing the two sets of parameters to identify the relationship between spatial visibility and users' creation of personal space.

Table 2: Identified parameters, data collection methods, data types, and intended outcomes

	Parameter	Data Collection Methods	Data	Intended Outcome
Visibility	P1 - Overall Visibility	Space syntax mapping by the DepthMapX software	Visibility Graph Analysis (VGA)	Analyse the level of safety and segregation within the public spaces through visibility
	P2 - Point Visibility	Space syntax mapping by the DepthMapX software	Point Isovist map	
Users' spatial choice	P3 - Proximity	Observations Photographic documentation	Maintaining distance among groups and solo users	Understand the preferred physical distance between individuals or small groups
	P4 - Movement Patterns	Observations, Photographic, and video documentation	User movement types within the space	Understand whether dynamic or static movement patterns occur within the area

User behaviour in public open spaces is influenced by spatial and environmental conditions; therefore, behavioural observations were compared with visibility conditions to understand how users selected, occupied, and moved through each node (Han et al., 2022). This cross-analysis helped identify whether users preferred highly visible central spaces, partially visible edge zones, or lower visibility shaded areas. It also allowed the study to examine whether static activities, such as sitting and intimate conversation, occurred more often in areas with controlled visibility, while dynamic activities, such as walking and passing through, occurred more often in highly visible areas.

Behavioural observations were conducted over three weekdays and one weekend day to capture both regular weekday use and weekend public-space use. On each observation day, data were collected during four time periods: morning from 9.00 a.m. to 12.00 noon, afternoon from 12.00 noon to 3.00 p.m., evening from 3.00 p.m. to 6.00 p.m., and night from 6.00 p.m. to 9.00 p.m. This allowed the study to observe variations in spatial use across different levels of activity, climate comfort, and user presence throughout the day.

Users were classified into main groups based on observable behaviour and group size. Individual users were recorded as single users occupying or moving through the space alone. Intimate groups were identified as pairs or small groups of 3–5 persons engaged in close social interaction. Large groups were defined as groups with more than 5 persons occupying or moving through the space together. These classifications helped compare how different user types responded to different visibility conditions. For this paper, the behavioural findings are presented as average observed patterns across the selected observation days and time periods, rather than as separate results for each time slot.

The number of users was not fixed and varied according to the time of day, day type, and level of activity within the site. Therefore, a fixed sample size was not predetermined. Instead, the study counted the selected observable user groups within each node during each observation period.

4. CASE STUDY

This case study examines a significant public space in Colombo, Sri Lanka, the Independence Square monument. The site is located within the Cinnamon Gardens area of Colombo 07, a zone known for its historical and prestigious urban character.

4.1 CASE STUDY SELECTION JUSTIFICATION

Independence Square was selected as the case study because it is a significant urban public space in Colombo that supports recreation, social interaction, pedestrian movement, and relaxation within a dense urban context. The site is used by different user groups, including individuals, intimate groups, local visitors, foreign visitors, and larger groups, making it suitable for observing personal space behaviour in a public setting.

4.2 NODE SELECTION

The spatial character of the case study area varies significantly across different parts of the site. The area consists of both built structures and landscape spaces, each offering different spatial conditions. Therefore, to improve the accuracy of the research, two distinct nodes were identified within the case study area for more detailed investigation.

- Node 1: Independence Memorial Hall

It represents a built architectural setting where visibility is shaped by columns, the elevated plinth, central open space, and peripheral edge zones. These elements create different degrees of exposure and enclosure, making the node suitable for examining how users respond to architectural control of visibility.

- Node 2: Independence Square Park

It represents a landscape-based public setting where visibility is influenced by tree canopies, shaded areas, pond ledges, pathways, and vegetated edges. This node allows the study to examine how softer landscape elements create controlled visibility and support personal space creation.

4.3 RESEARCH RESULTS

4.3.1 Visibility Parameters Analysis

NODE 1

P1 – overall visibility

The visibility of this node is analysed considering:

1. Visibility to the immediate neighbourhood
2. Visibility within the structure

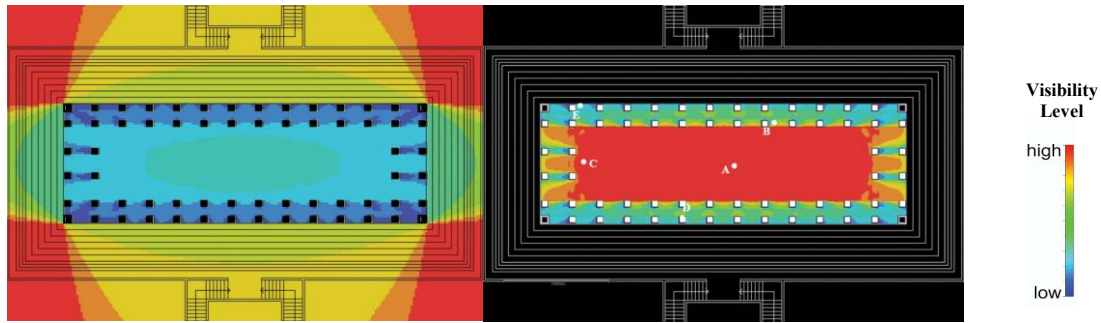


Figure 3: Node 1 – VGA of exposure to exterior

Figure 4: Node 1 – VGA of the internal space

According to the visibility graph in Figure 3, the peripheral edges of the structure are clearly visible from a distance. However, the central area of the hall is comparatively less visible from the immediate neighborhood due to the presence of large structural columns. The hall is situated on an elevated plinth, which significantly enhances its visibility from the surrounding urban context.

According to the visibility graph in Figure 4, the central area of the hall demonstrates the highest internal visibility, whereas the edge zones show comparatively lower visibility within the interior space. The column configuration and spatial layout of the hall primarily influence internal visibility.

P2 – Point Visibility

This approach enables an understanding of how visibility varies across space and its contribution to spatial perception and internal visual connectivity.

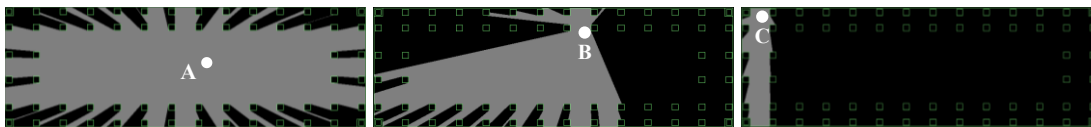


Figure 5: Node 1 – Point Isovist maps of selected points

Point A - Allows broader visual access across the interior.

Point B - Moderate level of visual access across the interior, compared to point A.

Point C - Visual access is low. There is very low outward visibility to other internal spaces from point C, and limited visibility directed toward point C from the surroundings.

NODE 2

P1 – overall visibility

On one side, the Independence Memorial Hall forms a visual barrier from Independence Avenue, while the remaining edges are largely enclosed by trees. Consequently, visual connections to the immediate vehicular road network are blocked.

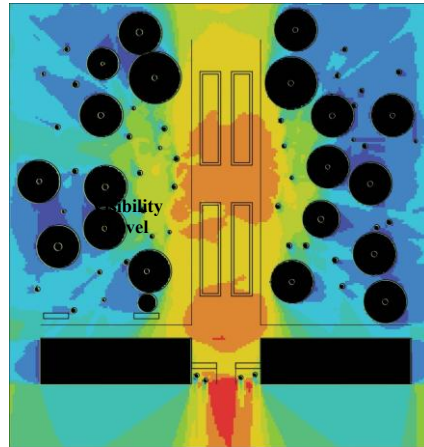


Figure 6: Node 2 -VGA

This area is surrounded by dense vegetation. At certain points, tree trunks are visible at eye level. However, in most locations, the tree canopy occurs at eye level, blocking direct sight. As a result, visibility toward the surrounding spaces is limited. According to the visibility graph, the open paved space within the node provides clear and unobstructed visual connections, confirming that although visibility to the surrounding areas is blocked, internal visibility within the node remains high.

P2 – Point Visibility

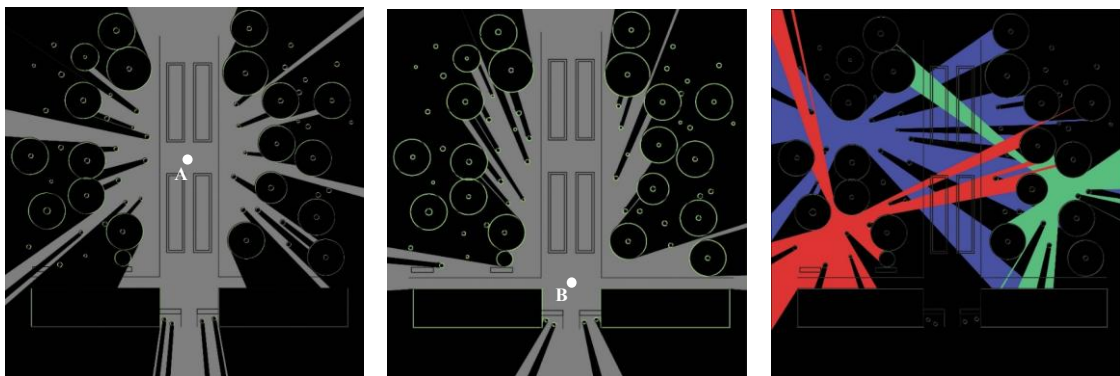


Figure 7: Node 2 – Point Isovist maps of selected points

Point A - Provides a straight visual connection from the Independence Memorial Hall to the Independence Walk.

Point B - Located at the intersection of two paths. Visibility is available in four directions, including the same direction as Point A and the perpendicular direction.

Comparatively less visual connectivity than point A and point B. Unpaved areas beneath the tree canopies, represented in blue, show comparatively limited visual connectivity.

4.3.2. Users' Spatial Choice Parameter Analysis

NODE 1

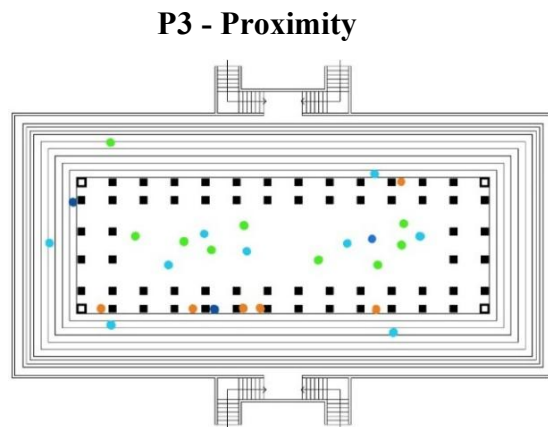


Figure 8: Node 1 – Points where user groups mostly spend

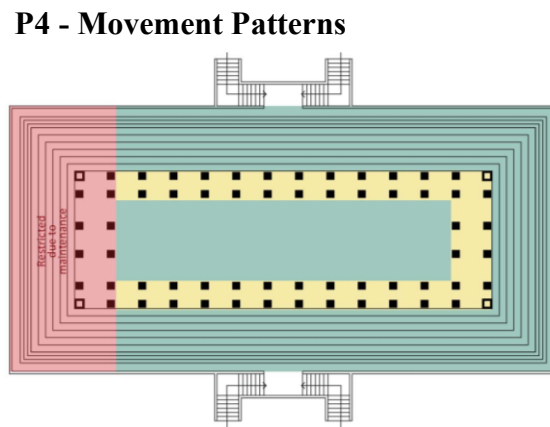


Figure 9: Node 1 – Behaviour mapping

- Individuals
- Local Intimate groups
- Foreign Intimate groups
- Large groups

Preferred area of individuals and local intimate groups for static postures

Preferred area of large groups and foreign intimate groups for movements

Restricted area due to maintenance

According to the collected data, individual users tend to occupy the peripheral areas of the hall. Similarly, local intimate groups are more likely to use the peripheral zones, often positioning themselves against the columns and leaning their backs on them. These users generally prefer the outer column ring rather than the inner ring. Large groups, however, do not remain seated for extended periods. They tend to spend most of their time in the central area of the space. Foreign intimate groups also show similar behaviour, preferring the central zone and remain for relatively short durations. When considering the time of day, no significant variation in spatial behaviour is observed. However, during the evening hours, the stepped areas are also used for seating, as the absence of direct sunlight improves thermal comfort and reduces discomfort.

NODE 2

P3 - Proximity

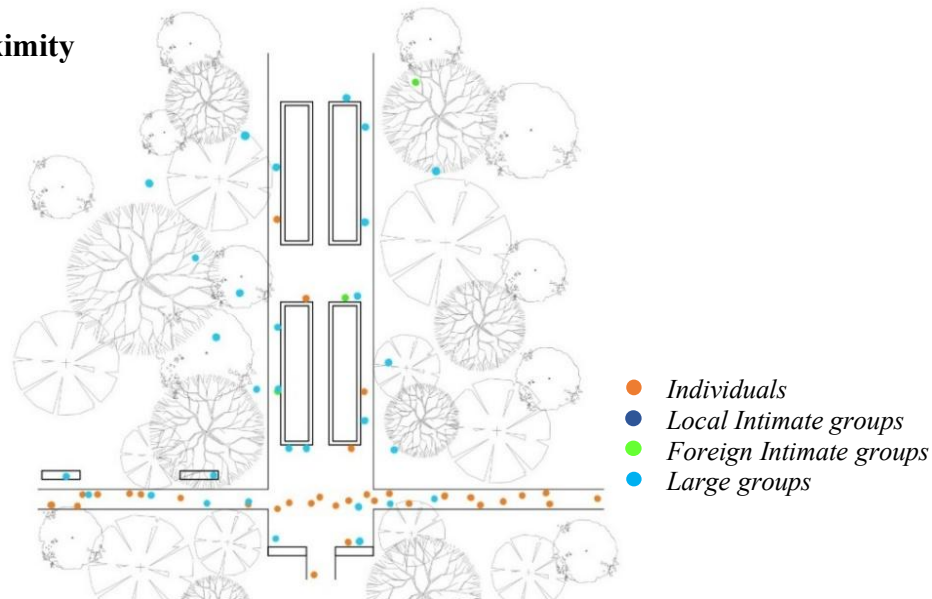


Figure 10: Node 2 – Points where user groups mostly spend

P4 - Movement Patterns

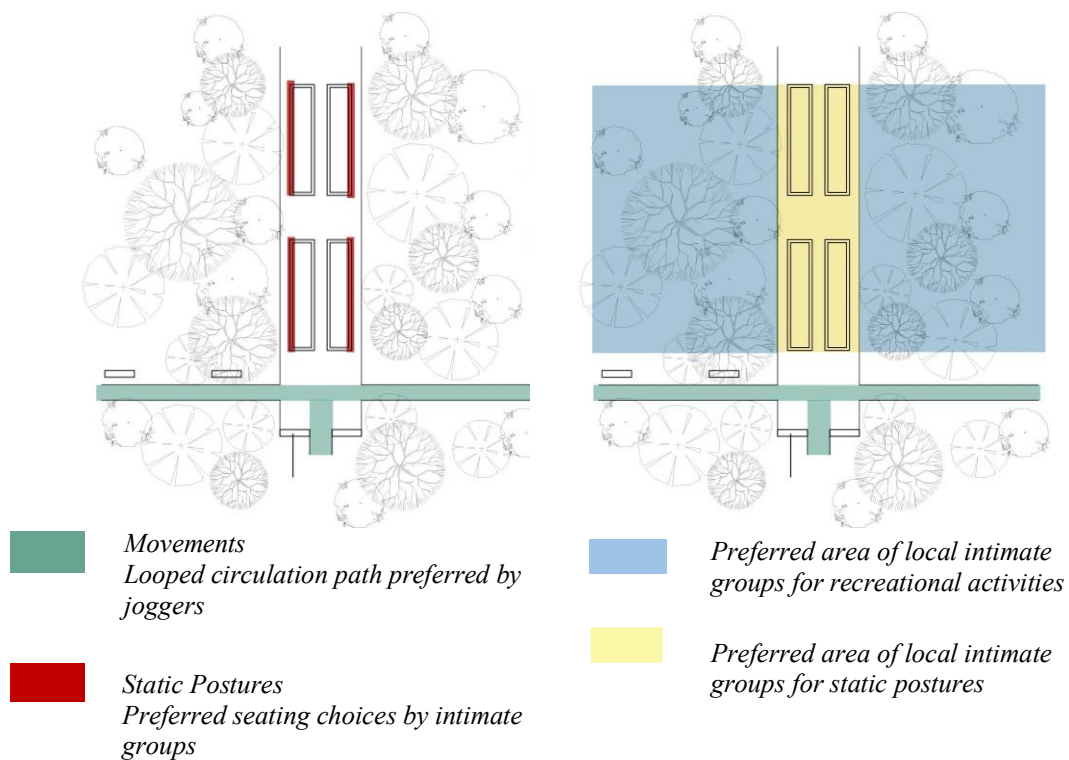


Figure 11: Node 2 – Behaviour mapping

According to the collected data, individual user movement is most prominent at the intersection of the two pedestrian paths along the Independence Walk. In contrast, the areas around the ponds show a higher occurrence of static activities, particularly seating. Users tend to select the pond ledges for sitting, with a clear preference for outward-facing

positions rather than inward-facing ones. The outermost pond ledges are used more frequently, as these areas are shaded and allow reduced interaction with nearby users, contributing to increased comfort and a sense of privacy.

In addition, the unpaved areas beneath the tree canopy are primarily used during the evening hours, when some intimate groups engage in activities such as playing and exercising. These shaded zones support group-based activities and provide an alternative spatial setting within the node.

4.4 FINAL DISCUSSION

Based on the analysis of the case study data, the following graphical summary illustrates the relationship between visibility levels and observed user behaviour.

According to the Visibility Graph Analysis data collected for each node,



Table 3: Relationship between visibility levels and observed user behaviour.

Visibility Level	User Behaviour	State Type	State Intensity
High visibility	Walking, group activities, and short stays	Dynamic	
		Static	
Medium visibility	Sitting, pausing, and casual interaction	Dynamic	
		Static	
Controlled visibility	Resting, intimate conversation, and longer stays	Dynamic	
		Static	
Low visibility	Perceived as unsafe or uncomfortable zones		

NODE 1

Column configuration enhances internal visibility & experience

The columns are the primary architectural-spatial mediator. Externally, they create a semi-permeable screen, making the hall partly visible while concealing its full activity.

Internally, they structure a hierarchy of space,

- The central void (high visibility): The column-free center offering panoramic views outward and being the most visually connected point inward. It is an active, social heart.
- The peripheral zones (Low Visibility): The spaces between and behind columns create niches of partial enclosure and privacy. This allows for smaller, intimate activities (resting, private conversation) within a major public hall.

The elevated plinth establishes a realm of psychological privacy

The raised platform visually separates the hall from the everyday flow of the city. This elevation creates a threshold of entry and supports the behaviour of small groups or individuals seeking a "spot of their own" without full isolation.

NODE 2

Landscape character enhances visibility and experience

This does not create private niches for individuals but establishes macro-scale privacy for the entire park collective. By severing visual ties to the enclosing roads and city, it generates a psychologically secluded realm.

The gradient of privacy

- High-exposure zone (paved pathways): For movement-based behaviour. Privacy is minimal, but the activity expects this.
- Medium-privacy zone (outer pond ledges): Users gain a degree of removal by positioning themselves at the edge, backed by water or vegetation, facing outward. They have a "territory" with a controlled view.
- Higher-privacy zone (shaded ground under trees): For social or focused group behaviour. The overhead canopy and tree trunks create a softer, more enveloping enclosure, allowing groups to feel separated.

This comparison confirms that personal space creation in urban public spaces depends not only on the level of visibility but also on how visibility is spatially structured. Architectural elements create more defined boundaries, while landscape elements create softer transitions.

4.5 RECOMMENDATIONS

The recommendations aim to strengthen existing spatial qualities to manage the visibility of space, allowing users to experience privacy within an open urban public setting.

Node 1 – As a protected historical monument, major physical interventions are not appropriate. The existing architectural elements already help manage visibility and create varying degrees of visual exposure within the same setting. This node successfully demonstrates how architectural form alone can regulate visibility and achieve a sense of privacy within an open public setting.

Node 2 – Privacy can be further enhanced by creating shaded edge zones that offer areas of reduced visibility. These shaded edges act as transitional zones between highly visible central areas and more secluded peripheral areas.

5. CONCLUSIONS

This study investigated the relationship between spatial visibility and the maintenance of privacy in urban open public spaces, using Independence Square in Colombo as a case study. While existing literature has predominantly emphasized visibility as a mechanism for safety and social interaction, this research demonstrates that visibility also functions as a critical mediator of privacy, a dimension increasingly relevant in contemporary urban life where individuals seek moments of withdrawal and personal reflection within public environments.

The research confirms that privacy in public spaces is not about complete visual obstruction but about providing users with choice and control over their visibility. Both architectural and landscape elements can successfully mediate this balance. For Node 1, the existing architectural form already demonstrates effective visibility regulation without requiring intervention. For Node 2, enhancing shaded edge zones as transitional spaces between high and low visibility areas would further support users' privacy needs.

These findings can inform design guidelines beyond the case study by highlighting the importance of controlled visibility. Architectural and landscape elements can be used to create partially enclosed spaces without producing unsafe hidden spaces. Such design strategies allow users to maintain personal space while remaining visually connected to the public environment.

Accordingly, urban public spaces should be planned with visibility gradients rather than uniform openness or complete enclosure. High-visibility areas can support movement, orientation, and public safety, while controlled-visibility areas can support sitting, resting, conversation, and longer occupation. This approach can help designers create public spaces that balance safety, social interaction, privacy, and user comfort in different urban contexts.

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