Illuminating Visual Landscape Narratives: The Impact of Street illumination on Spatial Experience and Identity in Ceremonial Streetscapes

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Abstract

This study examines how street illumination transforms visual landscape narratives and civic identity within Colombo's ceremonial streetscapes after dark. Focusing on Independence Avenue and Galle Face Green, it employs a mixed-method approach combining quantitative lighting measurements with qualitative user perception surveys. Illuminance levels and color temperature were recorded across six spatial zones, while 48 participants evaluated spatial legibility, emotional comfort, symbolic resonance, and place attachment. Results show that lighting hierarchy, temperature, and spatial sequencing strongly influence nighttime experience. Independence Avenue's hierarchical, monument-centered illumination strengthens civic symbolism but reduces spatial coherence, while Galle Face Green's diffuse ambient lighting enhances emotional comfort but weakens symbolic identity. Warm-white illumination (2700 to 3000K) increases comfort and attachment, whereas cooler tones improve monument visibility at the expense of atmospheric warmth. The study concludes that effective ceremonial illumination requires integrated strategies, including accent lighting for monuments (below 100 lux, 3000K), warm ambient light for social zones, and coherent gradients to sustain narrative unity. The research offers a framework for context-sensitive lighting design that balances functional and cultural dimensions of urban nightscapes, guiding landscape architects and policymakers in creating culturally resonant nighttime environments

Keywords: Visual Narratives, Street Illumination, Ceremonial Streetscape, Landscape, Colombo

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Introduction

Ceremonial streetscapes are some of the most important and prominent places in the city. These streetscapes are important for shaping a city's shared identity and memory because they are used for national events, public rituals, and cultural events. Their spatial arrangements, which include axial alignments, symmetry, and monumental features, create powerful visual narratives that help people move through sequences of important spaces (Lynch, 1960).

While the symbolic clarity and grandeur of ceremonial streetscapes is readily perceivable in daylight, their transformation at night driven largely by street illumination remains underexplored. Beyond mere visibility and safety, street illumination plays a critical role in affecting the atmosphere, spatial coherence, and symbolic meaning of these city corridors once the sun sets. The quality, intensity, and color temperature of artificial illumination can significantly alter perceptions of hierarchy, highlight or obscure monumental features, and influence how these spaces are psychologically and emotionally experienced (Kelly, 1952).

Ceremonial streetscapes are spatially and symbolically significant components of urban form. Designed to host national events, public rituals, and cultural performances, they are embedded with layered narratives that contribute to the collective identity and memory of a city (Jacobs, 1993). These streets are often defined by formal spatial structures such as axial alignments, symmetry, and monumental framing which create a strong visual narrative during the day (Moughtin, 2007). This narrative is not just a visual experience but a spatial story that guides people through sequences of symbolic spaces and forms (Lynch, 1960). However, most studies on ceremonial streetscapes have focused on the daytime nature of those streetscapes, such as their monumentality and formal landscape character. Their nighttime context, particularly the role of illumination in constructing visual and narrative unity, has not been properly explored.

Despite international fascination with "night urbanism" and nighttime placemaking, the symbolic and experiential aspects of how light forms Sri Lanka's public spaces have not been explored in depth. This creates a significant research gap on how street illumination supports and complicates the planned narrative of such significant civic spaces. In Sri Lanka, the street illumination script rarely engages with its symbolic or emotional aspects. To address this gap, this study provides a conceptual analysis of how visual landscape narratives in ceremonial streetscapes shift from day to night to guide culturally sensitive and emotionally informed design practice in Sri Lanka.

This research investigates how street illumination, as an integral component of landscape architecture, transforms user experiences and perceptions of selected ceremonial streetscapes in Colombo after dark. By focusing on Independence Avenue and Galle Face Green, two iconic spaces in Sri Lanka's capital, this research aims to decipher the multifaceted ways in which lighting affects spatial legibility, symbolic resonance, emotional comfort, and overall public attachment.

Ultimately, the goal is to inform lighting design strategies that not only support nighttime usability but also reinforce the civic meaning and cultural significance of these vital urban spaces (Gaston et al., 2012).

Key research questions addressed by this study are:

- How does street illumination influence spatial experience and perceptions of civic identity in Colombo's ceremonial streetscapes?
- What relationships exist between lighting characteristics (intensity, color temperature, hierarchy) and user perceptions of comfort, legibility, and symbolism?
- How can context-sensitive lighting strategies enhance both functional and cultural narratives in nighttime urban landscapes?

Study Aim

To investigate the role of street illumination in shaping nighttime visual landscape narratives, spatial legibility, and civic identity within Colombo's ceremonial streetscapes, and to provide empirical guidance for culturally grounded lighting design in Sri Lanka.

Key Objectives

To achieve this aim, the study purses four specific objectives.

1. To analyze user perceptions of comfort, symbolism, and attachment under different lighting conditions.
2. To examine relationships between illumination patterns and user behavior and interaction.
3. To assess how lighting affects spatial hierarchy and visual continuity in ceremonial streets.
4. To develop context-sensitive design recommendations for improving cultural and functional coherence in nighttime lighting strategies.

Expected Outcomes and contributions

This research will produce four critical outputs:

1. Empirical evidence on the relationship between lighting quality, symbolic meaning, and emotional comfort in ceremonial streetscapes.
2. A framework for assessing and designing illumination strategies that integrate functional visibility with cultural narratives.
3. Design guidelines emphasize balanced light hierarchy, appropriate color temperature, and spatial sequencing to enhance nighttime civic identity.
4. Culturally grounded criteria to inform lighting policy and urban standards in Sri Lanka.

Literature review

Urban lighting research underscores dual imperatives ensuring safe nighttime use while crafting environments that foster place attachment and collective identity. This review synthesizes foundational theories and contemporary research on visual narratives, ceremonial streetscapes, and illumination design principles, establishing theoretical framework for understanding how street illumination shapes nighttime spatial experience and civic identity.

Visual Narratives in Urban and Landscape Architecture

Urban and landscape visual narratives recognize spaces not merely as physical locations but as archives of experience, significance, and memory, communicated through materiality, sensory stimulation, spatial organization, and human occupancy patterns (Nijhuis, 2011). At the core of urban visual narrative interpretation is Lynch's (1960) theory of imageability, which identifies five key components structuring how people perceive, remember, and emotionally connect with cityscapes: paths, edges, districts, nodes, and landmarks. These elements form a cognitive framework enabling users to create mental maps, facilitating spatial navigation and meaningful attachment to urban space. Further studies by (Nasar, 1990) confirm the centrality of these factors in designing distinctive and memorable urban experiences.

Visual landscape narrative integrates topography, water features, vegetation, and natural processes, each superimposed with ecological, historical, and cultural meaning. Corner argues (Corner, 1999) that landscapes are dynamic narratives driven by physical and cultural layers; therefore, design should strive to express intrinsic narratives rather than imposing external ones. Temporal factors such as usage patterns, weather, and light cycles contribute to the dynamic narrative quality of landscapes. Sepe demonstrates, (Sepe, 2013) that strategic hierarchy, light and dark control, and landmark placement enhance urban narrative quality, shape movement, and affirm cultural significance.

In ceremonial streetscapes, visual narratives are intentionally constructed through spatial hierarchy, axiality, and symbolic element placement (Moughtin, 2007). These streetscapes function as places of civic pride and remembrance, where design creates experiential sequences supporting social identity (Mehta, 2014).

Symbolism and Civic Identity in Ceremonial Streetscapes

Ceremonial streetscapes serve as spatially and symbolically significant components of urban form, hosting national events, public rituals, and cultural performances embedded with layered narratives contributing to collective identity and memory (Jacobs, 1993). These streets are defined by formal spatial structures such as axial alignments, symmetry, and monumental framing, creating strong visual narratives during the day. This narrative is not merely visual experience but a spatial story guiding people through sequences of symbolic spaces and forms (Lynch, 1960).

(Vale, 2008) emphasizes that ceremonial streetscapes express civic identity, collective memory, and national pride, accommodating celebrations, parades, and demonstrations where political power and cultural ideals are spatially displayed. The symbolism is expressed through monumental scale, spatial hierarchy, and strategic positioning of public signs and artworks (Spiro Kostof, 1995). (Dovey, 2010) conceptualizes these as "urban theatres" where civic identity is continuously performed through ritual ceremonies and daily social existence.

Lighting extends civic symbolism into the night by illuminating monuments, creating ceremonial corridors, and making urban symbolic qualities legible after dark. Lighting hierarchy and appropriate color temperature selection increase legibility and emotional impact, reinforcing civic meanings (Gaston et al., 2012).

Lighting Design Principles

Lighting hierarchy refers to the gradual arrangement and organization of illumination level, location, and techniques in urban landscapes to create spatial order and visual priority (Boyce, 2014). Strong lighting hierarchy in ceremonial streetscapes permits both pedestrian and vehicular circulation, highlights monuments and focal points, and provides security and aesthetic value. This relates to Lynch's (1960) imageability, as illumination enhances visibility of spatial structure, defining circulation routes, edges, and highlighting landmarks especially when daylight is absent.

(Kelly, 1952) foundational lighting theory introduced three illumination modes: ambient luminescence (general visibility), focal glow (highlighting significant elements), and brilliants (creating drama or interest). These light layers can either strengthen or weaken a streetscape's intended identity. Empirical research by (Fotios & Gibbons, 2018) confirms that hierarchical lighting supports wayfinding and enhances perceived quality and usability of urban space at night.

Color temperature emerges as a significant variable influencing perception and behavior. Warm-white lighting (2,700–3,000K) is associated with comfort, sociability, and historical ambience, whereas cool-white light (4,000–5,000K) enhances visual clarity but may feel sterile. Research demonstrates that lower color temperatures correlate with higher perceived comfort and place attachment in public plazas.

Theoretical Framework

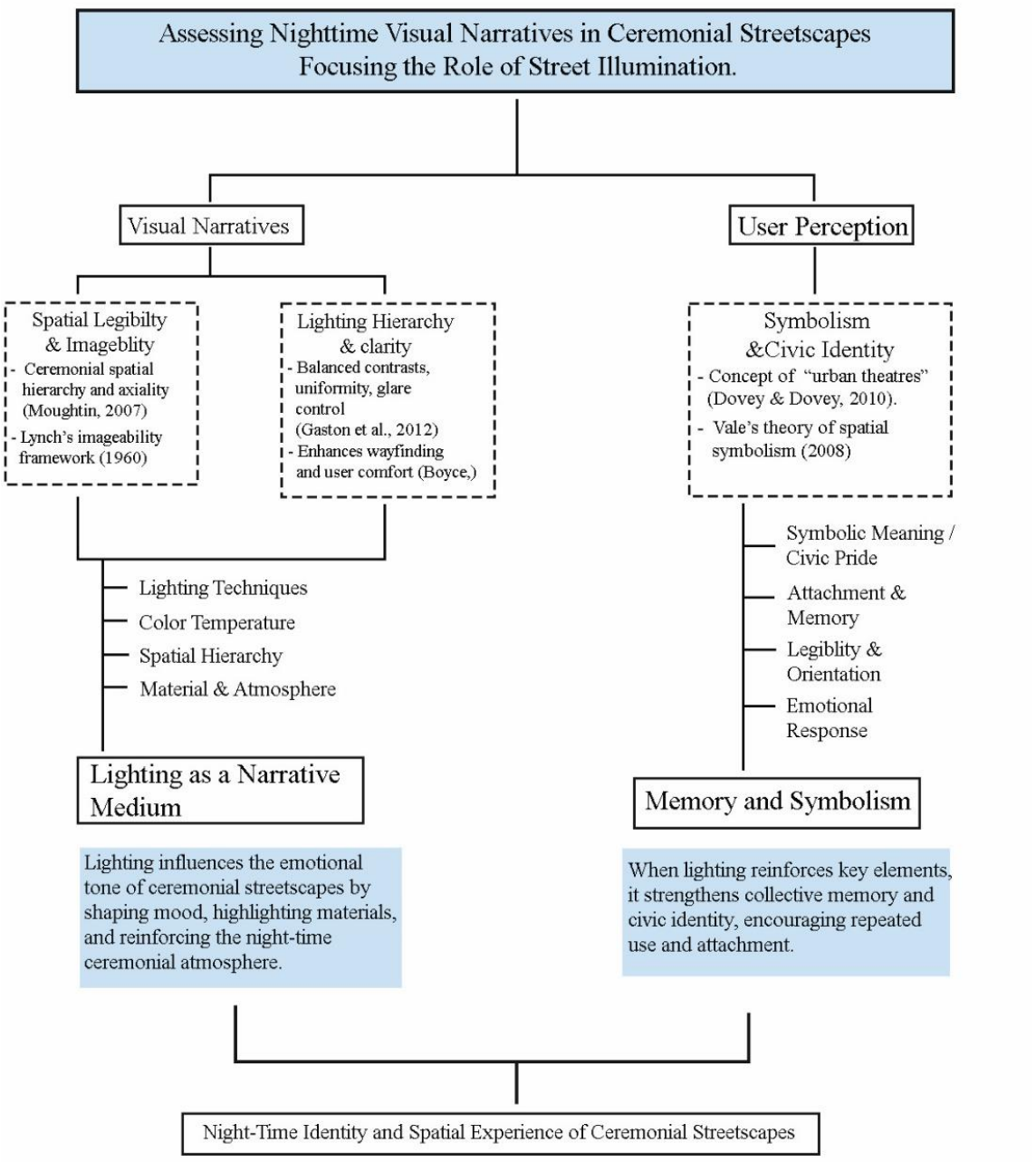


Fig. 1: Theoretical Framework
Source: author

Methodology

Research Design and Approach

This study employs a mixed-methods case study design, combining quantitative lighting measurements with qualitative user perception data to provide comprehensive understanding of how street illumination shapes nighttime spatial experience and civic identity in ceremonial

streetscapes. Two contrasting ceremonial spaces in Colombo were selected: Independence Avenue, a formal hierarchical boulevard, and Galle Face Green, an open seafront promenade. This typological contrast enables comparative analysis of how lighting strategies support distinct ceremonial narratives.

Fig. 2: Case Study Locations
Source: Google Maps

Data Collection Methods

Quantitative Measurements: Systematic lighting measurements were conducted at six representative spaces (three per site) using calibrated lux meters. Measurements recorded illuminance levels (lux) and correlated color temperature (CCT) over three evenings (18:00–20:00 hrs.). Using grid pattern measurement points per space yielded points, providing baseline data on existing lighting schemes and intensity variations.

Qualitative Survey: A structured questionnaire administered to Eight participants were recruited from each of six spaces, yielding 48 total respondents captured perceptions of spatial legibility, emotional comfort, perceived safety, symbolic resonance, and place attachment. Respondents used Likert-scale ratings (1–5) supplemented by open-ended responses on narrative themes evoked by lighting. Participants were recruited near case study locations ensuring familiarity with both day and night conditions.

The data within the light mapping based on the light intensity measured using lux meters were subjected to statistical testing to detect differences in illuminance across case locations. Descriptive statistics such as means and limits were used to describe the measured light distribution and its compliance with recommended standards. Furthermore, quantitative survey data, i.e. Likert-scale items, were examined through descriptive statistics and inferential statistics to assess the relationships between lighting features and users' perceptions of those features of safety, comfort and clarity

Results and analysis

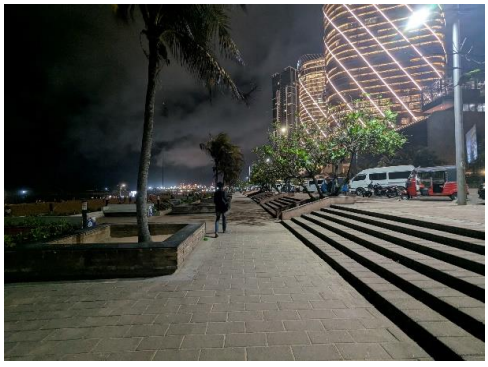
This section presents the quantitative lighting measurements and qualitative user perception findings from six representative spaces across the two case study sites: Independence Avenue and Galle Face Green. Results are organized by the four key research variables: symbolism and civic identity, attachment and memory, legibility and orientation, and emotional response and comfort.

Selected space 01 Independence Avenue

Selected space 02 Independence Avenue

Selected space 03 Independence Avenue

Selected space 01 Galle Face



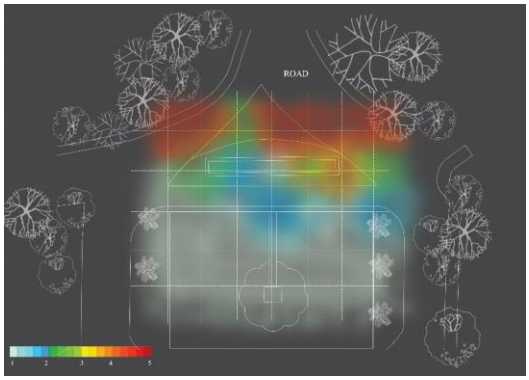
Selected space 02 Galle Face

Selected space 03 Galle Face

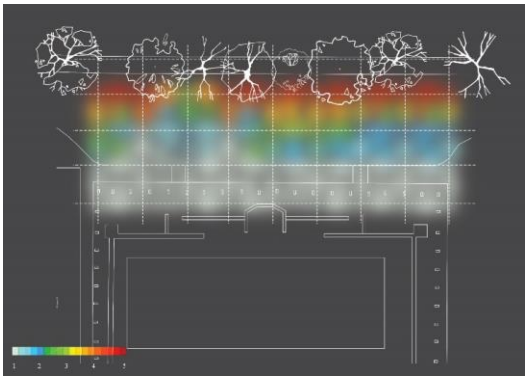
Fig. 3: Selected spaces
Source: author

Table 6: Results for the spaces: Average (Av.) and Standard Deviation (SD) in the scores of questionnaires for each variable

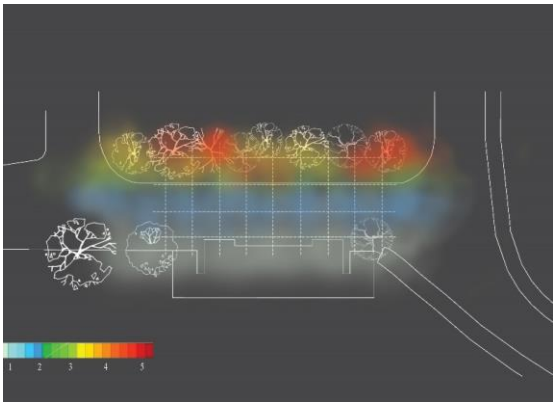
Space	Symbolism and Civic Identity		Attachment and Memory		Legibility and Orientation		Emotional Response and Comfort	
	AV	SD	AV	SD	AV	SD	AV	SD
SP 01 Independence Avenue	2.41	1.35	2.58	1.04	2.83	1.03	2.58	1.04
SP 02 Independence Avenue	3.87	1.05	2.88	0.78	3.16	0.80	2.96	0.81
SP 03 Independence Avenue	3.62	0.99	2.91	0.64	3.62	0.95	3.17	0.90
SP 01 Galle Face	2.33	0.80	2.67	0.89	3.08	1.11	3.12	1.02
SP 02 Galle Face	3.08	0.99	2.96	0.79	2.79	0.92	3.0	0.87
SP 03 Galle Face	3.37	1.03	3.0	0.76	3.37	1.03	3.04	0.89



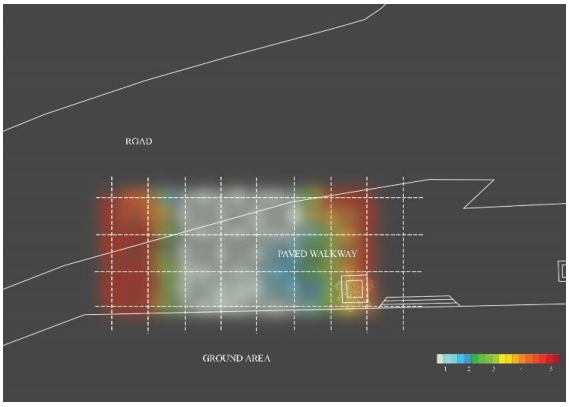
Lighting intensity map space 01 Independence Avenue



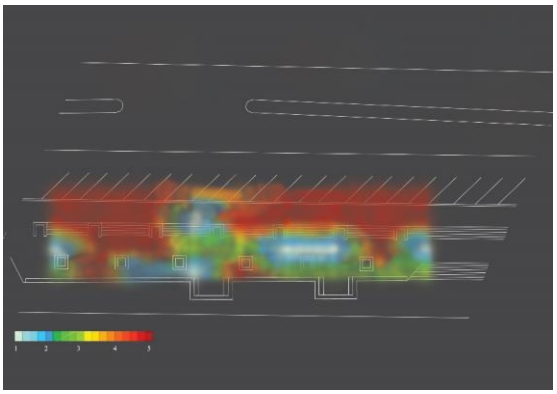
Lighting intensity map space 02 Independence Avenue



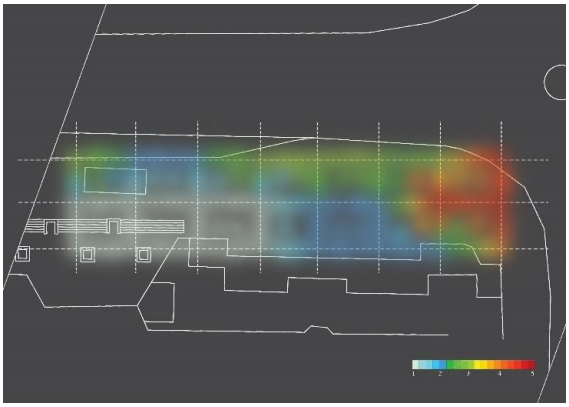
Lighting intensity map space 03 Independence Avenue



Lighting intensity map space 01 Galle Face



Lighting intensity map space 02 Galle Face



Lighting intensity map space 03 Galle Face

Fig. 4: Lighting intensity map for selected Locations
Source: author

Discussion

The study reveals critical insights into how street illumination functions as a multifaceted tool for shaping nighttime visual narratives, spatial legibility, and civic identity in ceremonial streetscapes. The contrast between Independence Avenue's hierarchical, monument-focused lighting strategy and Galle Face Green's diffuse ambient approach illustrates how fundamentally different lighting paradigms produce distinct experiential outcomes, each with distinct strengths and limitations.

Lighting Hierarchy and Symbolic Reinforcement

Independence Avenue's hierarchical monument-focused lighting successfully enhances civic symbolism at key ceremonial nodes, particularly at the Independence Memorial Hall (mean symbolism rating 3.87). This finding aligns with Kelly's (1952) layered lighting theory, which posits that strategic focal lighting on significant architectural and monumental elements can effectively reinforce spatial hierarchy and symbolic meaning. However, the inconsistent spatial legibility across the Avenue (Space 01 mean 2.83 vs. Space 03 mean 3.62) reveals a critical design failure: while monument nodes are effectively highlighted, the connection between these nodes remains

fragmented. This fragmentation disrupts the intended visual narrative of a cohesive ceremonial corridor, suggesting that effective ceremonial lighting requires not only accent lighting on landmarks but also careful sequencing and graduated illumination across the entire streetscape.

Color Temperature, Comfort, and Attachment

The quantitative analysis confirms that warm-white lighting (2,700–3,000K) correlates significantly with higher comfort ratings across both sites, while cooler temperatures (3,500–4,000K) enhance monument visibility but reduce atmospheric warmth. This finding validates decades of color temperature research while extending it into a South Asian ceremonial context. Importantly, however, high comfort ratings do not automatically translate to strong symbolic resonance or place attachment. Galle Face Green's ambient warm lighting produces moderate comfort scores (mean 3.0–3.12) but lower symbolic clarity (mean 2.33–3.37). This suggests a tension between functional/atmospheric goals and symbolic/identity objectives that requires designers to employ Kelly's layered approach: combining warm ambient lighting with cooler focal lighting to achieve both emotional comfort and civic meaning.

Both case studies exhibit critical gaps where lighting fails to support intended civic narratives. Independence Avenue's secondary spaces lack adequate symbolic emphasis, disrupting ceremonial continuity. Galle Face Green's lighting is dominated by peripheral commercial sources (One Galle Face mall), obscuring civic ceremonial meanings beneath mercantile imperatives. These gaps represent not merely technical oversights but policy failures: the absence of coherent, culturally sensitive lighting masterplans allows spaces to be redefined by commercial and functional forces rather than intended civic narratives.

Effective ceremonial streetscape lighting requires integrated strategies: accent lighting (<100 lux, 3,500–4,000K) for monuments to reinforce identity; warm ambient illumination (5–15 lux, ≤3,000K) for social spaces to enhance comfort; and graduated sequencing throughout the corridor to maintain visual and narrative coherence. Most critically, lighting design must be embedded within broader ceremonial master planning that prioritizes cultural meaning alongside functional requirements, ensuring that nighttime experiences reinforce rather than undermine the intended civic identity of these vital urban spaces.

Conclusion

This research confirms that street illumination is not merely a technical necessity but a cultural and narrative medium that transforms how ceremonial streetscapes are perceived and experienced at night. Through comparative analysis of Independence Avenue and Galle Face Green, the study demonstrates that the success of nighttime civic environments depends on the coherence between symbolic intent and sensory experience. Hierarchical, monument-focused lighting reinforces national identity but must be complemented by ambient and connective illumination to maintain narrative continuity. Similarly, while warm ambient lighting fosters comfort and sociability, it requires focal accents to articulate civic meaning.

The findings establish that lighting quality, especially hierarchy, temperature, and spatial distribution play a decisive role in shaping emotional comfort, spatial legibility, and collective memory. Effective design thus demands integrated planning frameworks that embed lighting strategies within broader ceremonial masterplans. By translating empirical evidence into design guidance, the study proposes context-sensitive illumination models that balance visibility, safety, and symbolism, thereby strengthening Colombo's nighttime civic identity and offering replicable insights for urban lighting design in other South Asian contexts.

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