Wijayarathne, P.N.S. and Hirudini, S.M., 2026. The impact of material expression at entrance thresholds on invitation to access: A comparative study of shopping malls in Colombo, Sri Lanka. In: Waidyasekara, K.G.A.S., Jayasena, H.S., Chandanie, H. and Tennakoon, G.A. (eds). *Proceedings of the 14th World Construction Symposium*, 10-11 July 2026, Sri Lanka. pp. 1707-1720. DOI: https://doi.org/10.31705/WCS.2026.124. Available from: https://ciobwcs.com/papers/

THE IMPACT OF MATERIAL EXPRESSION AT ENTRANCE THRESHOLDS ON INVITATION TO ACCESS: A COMPARATIVE STUDY OF SHOPPING MALLS IN COLOMBO, SRI LANKA

P.N.S. Wijayarathne[1] and S.M. Hirudini[2]

ABSTRACT

Entrance thresholds in contemporary shopping malls function as critical interfaces between urban public space and privately managed interiors. Previous studies have examined shopping malls in relation to circulation, branding, and commercial performance. But limited research has focused on how material expression at entrance thresholds influences perceived invitation to access. This study investigates the impact of material expression at entrance threshold on invitation to access in two contemporary shopping malls in Colombo, Sri Lanka: Mall A and Mall B. Two ground floor pedestrian entrances from each case study were analysed using a comparative case study approach. Material expression variables, including façade transparency, threshold framing, material contrast, and volumetric presence were documented through structured architectural observation. Spatial visibility was examined using Visibility Graph Analysis in DepthmapX to assess visual integration and connectivity. Invitation to access was evaluated through perception-based surveys capturing legibility, spatial clarity, and social openness. The findings reveal a consistent relationship between strong material expression, higher spatial integration, and stronger invitation profiles. Entrances characterised by transparent glazing, clear framing, and visible interior volume demonstrate higher visual prominence and perceived openness. In contrast, entrances with reduced material differentiation exhibit lower integration values and weaker invitation perception. The study positions material expression as a spatial mediator that shapes both visibility structure and perceived accessibility at the building threshold. These findings contribute to architectural understanding of threshold design within dense urban retail environments.

Keywords: *Entrance Threshold Architecture; Invitation to Access; Material Expression; Shopping Malls in Colombo, Spatial Visibility Analysis; Sri Lanka.*

1. INTRODUCTION

Shopping malls have become important architectural and urban elements in rapidly developing cities. In Colombo, Sri Lanka, large-scale retail complexes are more than commercial destinations; they function as key urban nodes within the city's dense and evolving fabric. Malls are privately owned but publicly accessible, placing them between

[1] Undergraduate, Architecture Department, University of Moratuwa, nathashaw99@gmail.com
[2] Senior Lecturer, Architecture Department, University of Moratuwa, mihirih@uom.lk

commercial control and urban openness. In this condition, entrance thresholds become particularly important because they shape how people move from exterior public space into interior retail environments. Entrance thresholds are more than simple access points. They structure movement, frame visibility, and define the boundary between the city and the building (Hillier & Hanson, 1984; Rapoport, 1982). Architectural decisions at the threshold influence how entrances are perceived from the outside. Transparency, framing, material contrast, and visible interior volume help people recognize an entrance and shape first impressions (Bitner, 1992; Pallasmaa, 2005). Research on shopping malls has widely examined circulation, commercial performance, branding, and interior spatial organization (Coleman, 2006). Existing studies in urban design and Space syntax and urban design studies have also examined spatial integration, visibility, and pedestrian movement in built environments (Hillier, 1996; Penn, 2003). Environmental psychology and wayfinding research show that spatial layout, visibility, and environmental cues influence perception, orientation, and approach behaviour in commercial spaces (Arthur & Passini, 1992; Donovan & Rossiter, 1982; Mehrabian & Russell, 1974). However, entrance thresholds are often treated mainly as façade elements or functional access points. They are less frequently examined as layered transitional zones shaped by material expression.

Although material treatment is central to architectural design, few empirical studies isolate material expression at entrance thresholds as a measurable factor influencing perceived accessibility. In rapidly urbanizing South Asian countries such as Sri Lanka, comparative spatial analysis of entrance threshold expression remains limited. This study addresses this gap by examining how material expression operates as a spatial mediator at the building edge. By focusing on material expression as a primary architectural variable, the research isolates façade transparency, threshold framing, material differentiation, and volumetric presence to examine their relationship with spatial visibility and perceived invitation to access. Based on the identified research gap, this study focuses on material expression at entrance thresholds and its relationship with perceived invitation to access in contemporary shopping malls in Colombo, Sri Lanka. The study specifically examines ground-floor pedestrian entrances and evaluates how façade transparency, threshold framing, material contrast, and visible interior volume influence spatial visibility and perceived openness within urban retail environments.

1.1 AIM AND OBJECTIVES

The aim of this study is to examine the impact of material expression at entrance thresholds on invitation to access in contemporary shopping malls in Colombo, Sri Lanka. To achieve this aim, the study addresses the following objectives:

- To identify key material expression characteristics at shopping mall entrance thresholds, including transparency, threshold framing, material contrast, and volumetric presence.
- To analyse spatial visibility conditions at entrance thresholds using Visibility Graph Analysis (VGA) in DepthmapX.
- To evaluate perceived invitation to access through perception-based surveys measuring openness, spatial clarity, and visual continuity.

1.2 SCOPE AND LIMITATIONS

This study focuses exclusively on material expression at selected ground-floor pedestrian entrance thresholds in two contemporary shopping malls in Colombo, Sri Lanka: Mall A and Mall B. Upper-level, basement, vehicular, service, and restricted-access entrances are excluded to maintain spatial consistency across cases. The analysis concentrates on architectural and spatial characteristics of entrance thresholds, including façade transparency, framing, material contrast, and volumetric presence. While spatial visibility metrics are incorporated to support architectural interpretation, the study does not examine retail performance, economic outcomes, or long-term behavioural patterns. The findings are based on two case studies and are therefore limited to comparable large-scale urban retail environments.

1.3 METHODOLOGICAL OVERVIEW

This study adopts a comparative case study approach focusing on four ground-floor pedestrian entrances across two shopping malls in Colombo, Sri Lanka. Material expression variables were documented through structured architectural observation. Spatial visibility was examined using Visibility Graph Analysis in DepthmapX to assess integration and connectivity within defined threshold boundaries. Invitation to access was evaluated through perception-based surveys capturing openness, spatial clarity, and visual continuity. Detailed methodological procedures are presented in section 3.

2. LITERATURE REVIEW

Entrance thresholds are important architectural zones where buildings meet the city. In shopping malls, these spaces act as controlled edges between public urban life and privately managed commercial interiors. Although malls are privately owned, they function as publicly accessible environments. Because of this, entrance design influences how openness, access, and spatial hierarchy are communicated. Previous research has examined shopping malls in relation to circulation systems, commercial performance, and spatial integration within retail environments (Coleman, 2006; Hillier, 1996; Penn, 2003). Research in environmental psychology has also explored how spatial layout, visibility, and environmental cues influence perception and movement behaviour in commercial settings (Arthur & Passini, 1992; Bitner, 1992; Donovan & Rossiter, 1982). However, limited attention has been given to material expression at entrance thresholds as a distinct architectural condition. Material qualities such as transparency, façade permeability, surface expression, and interior visibility influence how entrances are perceived and shape first impressions before entry occurs (Benedikt, 1979; Pallasmaa, 2005). Although studies have separately examined retail environments, spatial visibility, and environmental perception, limited research has specifically examined how material expression at shopping mall entrance thresholds influences invitation to access. Therefore, this review connects threshold theory, environmental perception, and spatial visibility studies to develop a focused framework for examining how material expression shapes invitation to access in contemporary shopping malls.

2.1 ENTRANCE THRESHOLD ARCHITECTURE AS A SPATIAL INTERFACE

An entrance threshold is the transitional zone between exterior public space and the interior of a building. Rather than functioning as a single doorway element, it includes the exterior approach, façade expression, entry line, and immediate interior landing zone.

Architectural theory describes thresholds as layered spatial conditions that structure movement, visibility, and boundary definition between different spatial domains (Hillier & Hanson, 1984; Rapoport, 1982). In shopping malls, where publicly accessible interiors are privately managed, entrance thresholds operate as critical architectural interfaces between urban public space and controlled commercial environments. Within these interfaces, material expression plays an important role in shaping how entrances are recognized and interpreted. Transparency, façade articulation, framing elements, and visible interior volume influence how clearly an entrance is distinguished from the surrounding façade and how effectively it communicates accessibility. Material differentiation can strengthen spatial hierarchy and reinforce the recognizability of entry points within large-scale retail environments. Architectural literature further suggests that materials communicate meaning through light, texture, depth, and visual continuity (Pallasmaa, 2005). Similarly, framing elements and symbolic architectural expression help define thresholds as points of transition between spatial conditions (Eco, 1986; Rapoport, 1982).

Research on architectural perception also demonstrates that glazing proportion, façade permeability, and visible interior depth influence how buildings communicate openness and spatial accessibility (Benedikt, 1979; Pallasmaa, 2005). In commercial environments, clearly articulated entrances improve recognizability and support spatial orientation within complex retail developments (Coleman, 2006). Recent research on shopping Centre façades further indicates that façade attributes influence public preference and the perceived quality of commercial buildings (Khomeiri et al., 2025). And Recent urban interface research also highlights that ground-floor façade permeability can influence pedestrian activity and the experience of public space (Abdelmonem, 2022). Together, these studies indicate that material expression influences both perceptual interpretation and spatial recognition at architectural thresholds. However, while previous studies have examined threshold conditions, spatial visibility, and retail perception separately, limited research has specifically examined how material expression at shopping mall entrance thresholds shapes invitation to access. Based on this literature, material expression at entrance thresholds can be examined through the following architectural dimensions:

Table 1: Material expression dimensions at entrance threshold architecture by author

Material Dimension	Explanation	Key Sources
Transparency and Visual Permeability	Degree to which interior space is visible from exterior	Benedikt (1979); Bitner (1992)
Surface Expression and Framing	Architectural elements that define and emphasise the entry line	Eco (1986); Rapoport (1982)
Material Contrast	Distinction between entrance zone and surrounding façade	Rapoport (1982)
Volumetric Presence	Visibility of interior height and spatial depth at the threshold	Benedikt (1979); Hillier & Hanson (1984)
Light and Reflectivity	Role of lighting and surface quality in enhancing recognition	Pallasmaa (2005)

2.2 MATERIAL EXPRESSION AND PERCEIVED OPENNESS

Material expression at entrance thresholds influences how users interpret openness and accessibility before entering a building. Environmental psychology explains this relationship through the Stimulus-Organism-Response (S-O-R) framework, where physical environmental conditions act as stimuli that shape perceptual and behavioural responses (Mehrabian & Russell, 1974). Empirical research in retail environments further demonstrates that environmental cues at entrances influence emotional response, spatial interpretation, and approach behaviour (Bitner, 1992; Donovan & Rossiter, 1982). Research on wayfinding and spatial cognition also suggests that transparency and visible interior activity reduce uncertainty and increase perceived accessibility at entry points (Arthur & Passini, 1992). Within this context, material expression operates as the primary architectural stimulus at the building edge. Transparency and interior visibility reduce uncertainty during pedestrian approach by allowing users to visually understand interior depth and circulation before entry occurs (Arthur & Passini, 1992; Benedikt, 1979). When entrances provide clear visual continuity between exterior and interior spaces, the cognitive effort required at the point of entry is reduced. Similarly, framing elements and material contrast help users recognize entrances more clearly and interpret access conditions.

Prospect-refuge theory further supports this relationship by suggesting that people prefer environments balancing visibility with a sense of protection (Appleton, 1975). At entrance thresholds, this balance can be achieved through framed glazing, recessed entries, or sheltered canopies, which allow visual access while maintaining environmental comfort. Research on commercial environments also indicates that lighting quality, material transparency, and façade expression influence emotional response and behavioural expectations within retail settings (Bitner, 1992; Donovan & Rossiter, 1982). Together, these studies suggest that material expression influences both perceptual interpretation and behavioural response at architectural thresholds. Recent experimental research also shows that entrance transparency and door-opening conditions influence perceived hospitality, mental ease of access, and invitation (Pijls et al., 2023). In this study, perceived openness is examined through the concept of invitation to access. This concept refers to how clearly and comfortably an entrance communicates openness, accessibility, and permission to enter. Although previous studies have examined environmental perception, retail behaviour, and spatial visibility separately, limited research has specifically examined how material expression at shopping mall entrance thresholds shapes invitation to access within contemporary urban retail environments.

2.3 INVITATION TO ACCESS AS A PERCEPTUAL CONSTRUCT

Invitation to access refers to the extent to which an entrance is perceived as open, understandable, and socially acceptable to enter. It is a perceptual interpretation that occurs during approach, before users physically cross the threshold. Unlike functional accessibility, which focuses primarily on physical entry conditions, invitation to access concerns how architectural cues communicate openness, inclusion, and perceived permission to enter. Environmental psychology suggests that physical environments influence emotional and cognitive responses that guide approach behaviour (Mehrabian & Russell, 1974). In retail environments, clarity, visibility, and environmental comfort are associated with stronger approach tendencies and positive behavioural responses (Bitner, 1992; Donovan & Rossiter, 1982). At entrance thresholds, these perceptual

responses are shaped by material expression, visual accessibility, and boundary definition. Publicness theory further explains that perceptions of openness are influenced by visible regulation and spatial signalling within publicly accessible environments. Even when entrances are physically accessible, architectural cues such as opaque façades, recessed entries, or strong visual barriers may reduce the perceived openness of the threshold.

In contrast, transparent glazing, visible interior activity, and clearly framed entrances communicate accessibility and strengthen perceived openness. Wayfinding research also demonstrates that clarity at decision points reduces cognitive effort and increases confidence during movement (Arthur & Passini, 1992). When entrances are materially and visually legible, users require less interpretation before deciding to enter. Together, these studies suggest that invitation to access is shaped not only by physical accessibility, but also by how architectural expression communicates openness and spatial clarity at the building edge. In this study, invitation to access is interpreted through four perceptual indicators: openness, spatial clarity, comfort, and visual continuity. Openness refers to the perceived public accessibility of the entrance. Spatial clarity refers to how easily users understand the direction and location of entry. Comfort refers to the environmental and psychological ease experienced during approach and entry. Visual continuity refers to the perceived connection between exterior and interior spaces. Together, these indicators provide a framework for evaluating how material expression influences perceived invitation at shopping mall entrance thresholds.

2.4 CONCEPTUAL FRAMEWORK

This study adopts a focused conceptual framework to examine how material expression at entrance thresholds influences perceived invitation to access. Material expression is treated as the primary architectural stimulus, while invitation to access is treated as the perceptual response. This framing builds on environmental psychology, architectural perception, and retail threshold studies, which collectively suggest that physical design cues shape how users interpret access, openness, and spatial clarity (Bitner, 1992; Mehrabian & Russell, 1974; Pallasmaa, 2005). Within this framework, façade transparency, material contrast, lighting treatment, threshold framing, and visible interior volume are understood as material cues that influence visual preview, spatial continuity, and symbolic signalling at the building edge. Users interpret these cues in terms of openness, clarity, inclusivity, and perceived permission to enter. Rather than examining entrance threshold architecture as a broad set of variables, this study isolates material expression to evaluate its specific influence on invitation to access in contemporary shopping malls. This framework therefore links three bodies of literature: entrance threshold theory, material expression and perception, and spatial visibility. It responds to the identified gap by examining how material expression at shopping mall thresholds operates as a spatial mediator between architectural form and perceived invitation.

Table 2: Analytical structure of the study by author

Component	Focus	Key Indicators
Architectural Stimulus	Material Expression at Entrance Threshold	Transparency, façade expression, material contrast, lighting, volumetric visibility

Component	Focus	Key Indicators
Perceptual Response	Invitation to Access	Perceived openness, clarity of entry, inclusivity, permission to enter
Relationship Tested	Impact Analysis	How material expression influences perceived invitation

3. METHODOLOGY

3.1 RESEARCH DESIGN

This study adopts a comparative case study approach to examine how material expression at entrance thresholds influences invitation to access in contemporary shopping malls in Colombo, Sri Lanka. The research focuses on four ground-floor pedestrian entrances across two shopping malls, referred to as Mall A and Mall B to maintain anonymity in data collection and reporting. The analyzed entrances are identified as Entrance 1 and Entrance 2 within each case study. Material expression is treated as the primary architectural variable, with transparency, façade articulation, material contrast, lighting treatment, and visible interior volume examined as key spatial stimuli at the threshold. These material conditions are analyzed in relation to how users perceive openness, spatial clarity, comfort, and visual continuity during approach and entry. The research design integrates three methodological components: architectural documentation, perception-based survey responses, and spatial visibility analysis using DepthmapX. This mixed-method structure enables both spatial and perceptual evaluation within a consistent analytical framework.

3.2 CASE STUDY SELECTION

Two contemporary shopping malls in Colombo, Sri Lanka were selected and anonymized as Mall A and Mall B. Within each mall, two public ground-floor pedestrian entrances were analyzed.

Figure 1: Ground floor plan layout of mall A and Ground floor plan layout of Mall B (Source: Author)

The entrances were selected using purposive sampling because they offered comparable public access conditions while showing clear variation in material expression and threshold configuration. Only ground-floor pedestrian entrances connected to surrounding public or semi-public approach spaces were included. Upper-level,

basement, vehicular, service, and restricted-access entrances were excluded to maintain spatial consistency. The selected entrances were comparable because each functioned as a publicly accessible mall entrance within a large-scale retail environment. However, they differed in entrance hierarchy, façade transparency, threshold framing, interior visibility, surrounding activity, security presence, and urban exposure. These differences allowed the study to examine how variations in material expression influence perceived invitation to access across comparable entrance conditions.

Table 3: Summary of case study entrances by Author

Mall	Entrance	Role	Approach Condition	Key Material/Spatial Variation
Mall A	Entrance 1	Primary	Plaza-facing, axial approach	High transparency, strong framing, visible interior volume
Mall A	Entrance 2	Secondary	Recessed roadside approach	Lower material contrast, limited interior preview, stronger control presence
Mall B	Entrance 1	Primary	Forecourt-facing approach	High transparency, canopy emphasis, visible interior volume
Mall B	Entrance 2	Secondary	Courtyard-based approach	Moderate transparency, softer framing, localised visibility

3.3 DELIMITATION OF ENTRANCE THRESHOLD BOUNDARY

For analytical consistency, the entrance threshold boundary was operationally defined as the transitional zone extending from the immediate exterior approach to the first interior landing space. This boundary included three spatial layers:

- Exterior approach zone (early visual recognition area)
- Façade and doorway line (formal entry plane)
- Interior landing zone (completion of transition)

This definition ensured that material expression was assessed within a clearly bounded spatial field across all case studies. The same threshold depth was modelled and analysed in each entrance to maintain comparability.

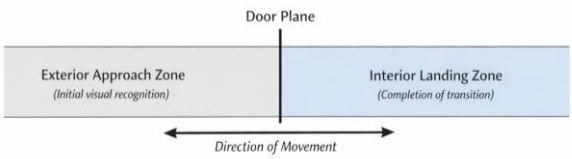

Figure 2: Diagrammatic representation of entrance threshold boundary (source: author)

3.4 DATA COLLECTION AND ANALYSIS

Data collection integrated architectural documentation, perception-based evaluation, and spatial visibility analysis. Each component was applied consistently across all four entrances.

3.4.1 Architectural Material Documentation

Structured on-site observation recorded material expression variables within the defined threshold boundary: transparency, material contrast, threshold framing, lighting treatment, volumetric presence, and façade depth expression. These variables captured glazing and interior preview, façade differentiation, framing devices, entry lighting, visible interior height and depth, and recessed or projected threshold conditions. Photographs and annotated sketches supported comparison across the four entrances.

- Transparency- Extent of glazing and interior visual preview
- Material Contrast- Degree of differentiation from adjacent façade elements
- Threshold Framing-Presence of canopy, structural emphasis, or framing devices
- Lighting Treatment-Natural and artificial lighting conditions at entry
- Volumetric Presence- Visibility of interior height and spatial depth
- Façade Depth Expression- Recessed or projected threshold condition

3.4.2 Perception-Based Survey

Short intercept interviews were conducted immediately after participants crossed the entrance threshold to capture first impressions of invitation to access. Respondents were selected using random intercept sampling, where every available adult pedestrian exiting the threshold zone during the survey period was approached when practical. Thirty participants were surveyed at each entrance, resulting in 120 total responses. Surveys were conducted during regular daytime operating hours across both weekday and weekend periods to reduce bias from a single time condition. The survey items were developed from the invitation to access indicators identified in the literature review and conceptual framework. These indicators were openness, spatial clarity, comfort, and visual continuity. Responses were recorded using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), and were aggregated to produce mean scores for comparative analysis.

- Openness- perceived public accessibility
- Spatial clarity- ease of understanding the entry direction
- Comfort- environmental and psychological case
- Visual continuity- perceived connection between exterior and interior

3.4.3 Spatial Visibility Analysis

Visibility Graph Analysis (VGA) was conducted using DepthmapX (Turner, 2004). Simplified ground-floor plans were modelled within the defined threshold boundary to evaluate spatial visibility conditions. Two spatial metrics were extracted: visual integration (Rn), which indicates the degree of spatial prominence within the visibility network, and visual connectivity, which represents the number of directly visible spatial connections from a given point.

3.4.4 Analytical Strategy

Comparative analysis was conducted at two levels: Within-case comparison between primary and secondary entrances in each mall and Cross-case comparison between Mall A and Mall B. Material expression variables were interpreted alongside spatial visibility metrics and perception scores to evaluate relationships between façade expression and invitation to access.

4. RESULTS

This section presents the comparative findings across four selected entrances. Results are structured in three stages: material expression analysis, spatial visibility metrics, and invitation to access evaluation.

4.1 MATERIAL EXPRESSION PROFILES

Table 4: Material Expression Profiles by Author

Entrance	Transparency	Threshold Framing	Material Contrast	Volumetric Presence
Mall A Entrance 1	High - full-height glazing, clear interior preview	Strong canopy and symmetrical expression	High - Extensive use of transparent materials and minimal structural obstruction	Double-height atrium visible from exterior
Mall A Entrance 2	Moderate-Low - blended façade, limited preview	Weak framing integrated with retail frontage	Low - minimal differentiation	Compressed interior not visible until entry
Mall B Entrance 1	High - transparent glazing with visible interior volume	Strong canopy and façade emphasis	High - coherent material hierarchy	Double-height lobby visible
Mall B Entrance 2	Moderate - partial transparency	Subtle architectural emphasis	Moderate - softer expression	Moderate interior volume

Figure 3: Material expression profile of Mall A- Entrance 1 (Source: Author)

Figure 4: Material expression profile of Mall A- Entrance 2 (Source: Author)

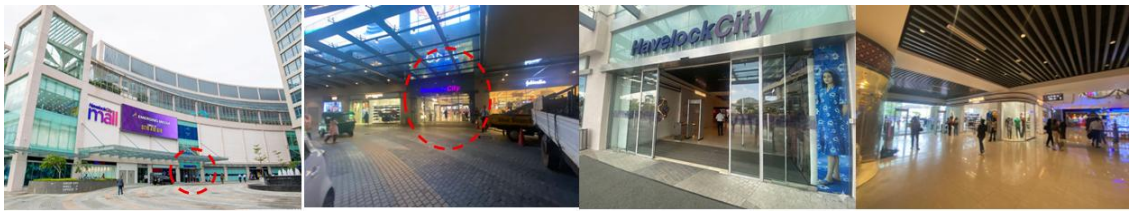

Figure 5: Material expression profile of Mall B- Entrance 1 (Source: Author)

Figure 6: Material expression profile of Mall B-Entrance 2 (Source: Author)

The comparison reveals clear differences in material articulation across the four entrances. Primary entrances in both malls demonstrate stronger transparency, clearer threshold framing, and greater visible interior volume, while secondary entrances exhibit weaker façade differentiation and more limited interior preview. These variations establish differing conditions of spatial prominence and perceived accessibility prior to entry.

4.2 SPATIAL VISIBILITY RESULTS

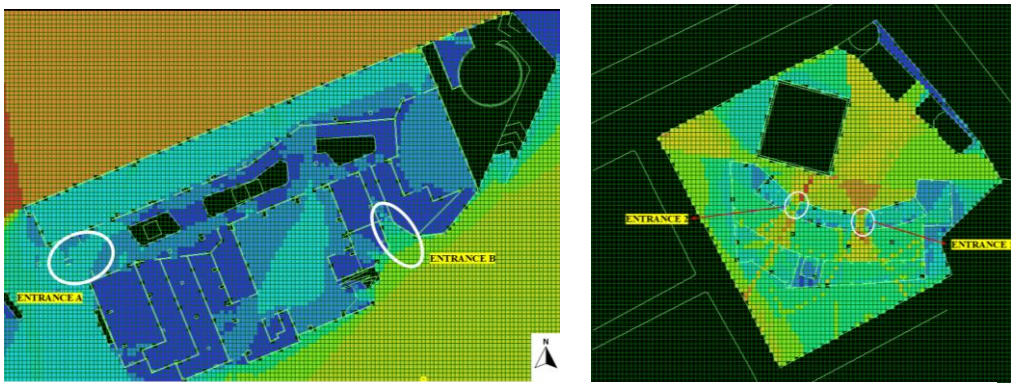

Figure 7: Visibility Connectivity map of CCC both entrances and HCM both entrances (Source: DepthmapX)

Visibility Graph Analysis (VGA) showed clear differences in integration and connectivity across the four entrances. Mall A-Entrance 1 and Mall B-Entrance 1 recorded the highest visual integration values, indicating stronger visibility links between exterior approach areas and interior circulation spaces. Mall A-Entrance 2 recorded the lowest integration due to its recessed threshold condition and limited interior visibility, while Mall B-Entrance 2 showed moderate integration within its courtyard setting. Connectivity followed a similar pattern: transparent entrances with open forecourt conditions produced stronger local visual connections, while recessed entrances with limited façade permeability showed lower connectivity. Overall, entrances with stronger material articulation and visible interior volume demonstrated higher spatial visibility and integration.

Table 5: DepthmapX Visibility Metrics by Author

Entrance	Integration (Rn)	Connectivity	Visibility Profile
Mall A-Entrance 1	1.65-1.90	120-160	Highly integrated
Mall A-Entrance 2	0.85-1.05	40-60	Visually constrained
Mall B-Entrance 1	1.45-1.75	95-140	Well-connected
Mall B-Entrance 2	1.10-1.30	75-95	Locally embedded

4.3 INVITATION TO ACCESS RESULTS

Primary entrances demonstrated stronger invitation profiles than secondary entrances. Mall A-Entrance 1 and Mall B-Entrance 1 recorded the highest overall scores, particularly for openness, spatial clarity, and visual continuity. Mall A-Entrance 2 recorded the lowest scores, corresponding with reduced façade expression, limited interior preview, and weaker spatial integration, while Mall B-Entrance 2 showed moderate–high invitation levels within its courtyard-based setting. Across both malls, entrances with higher transparency, stronger material contrast, and visible interior volume showed clearer alignment between material articulation, spatial integration, and invitation to access. The survey was designed as a focused comparative perception tool; therefore, the analysis relied on descriptive comparison of mean scores derived from 120 respondents, with 30 respondents surveyed at each entrance. (**Note.** Mean scores were interpreted as follows: 1.0–2.0 = Low; 2.1–3.0 = Moderate; 3.1–4.0 = Moderate–High; 4.1–5.0 = High.)

Table 6: Invitation to access mean scores

IA Dimension	Mall A - Entrance 1	Mall A - Entrance 2	Mall B - Entrance 1	Mall B - Entrance 2
Openness	4.4	3.1	4.5	3.8
Spatial Clarity	4.3	3.0	4.4	3.7
Comfort	4.1	3.2	4.2	3.9
Visual Continuity	4.2	3.1	4.3	3.8
Overall Mean	4.25	3.10	4.35	3.80
Interpretation	High	Moderate-High	High	Moderate-High

5. DISCUSSION

The findings indicate that material expression at entrance thresholds is associated with both spatial prominence and perceived invitation to access. Entrances with higher transparency, clear framing, and visible interior volume demonstrated stronger spatial integration and clearer invitation patterns. This aligns with architectural perception and wayfinding literature, which suggests that visual continuity and legibility reduce uncertainty during movement through built environments (Arthur & Passini, 1992; Benedikt, 1979). Transparent glazing allows pedestrians to preview interior activity

before entry, while threshold framing and material contrast distinguish the entrance from surrounding retail frontage. The relationship between façade transparency and spatial visibility also aligns with space syntax studies, where visually integrated spaces are associated with stronger spatial prominence and movement potential (Hillier, 1996; Penn, 2003). Perception results followed a similar pattern, with visually continuous entrances receiving higher ratings for openness and legibility. These findings also support servicescape research, which shows that environmental cues shape emotional response and approach behaviour in commercial environments (Bitner, 1992; Donovan & Rossiter, 1982). The present study extends these arguments by showing how material expression at shopping mall entrance thresholds contributes to perceived invitation before entry occurs. The analysis further reveals a clear distinction between primary and secondary entrances. Primary entrances demonstrated stronger material articulation, higher spatial integration values, and stronger invitation profiles, while secondary entrances showed weaker façade emphasis and lower integration levels. This suggests that entrance hierarchy is partly constructed through material expression. Elements such as transparency, threshold framing, and visible interior volume reinforce the prominence of primary entrances within the urban interface, whereas secondary entrances remain functionally accessible but less visually emphasized. This finding is consistent with retail design literature, which suggests that clearly articulated entrances support recognizability and orientation within large-scale commercial environments (Coleman, 2006). However, the relationship identified in this study should be interpreted as correlational and perceptual rather than strictly causal. Although material expression showed a strong association with invitation to access, other spatial and environmental factors may also influence how pedestrians interpret entrances. These include entrance location, pedestrian flow, signage visibility, lighting intensity, entrance width, surrounding retail activity, and security presence. While this study focused on material expression as the primary architectural variable, other factors within the wider threshold condition may also contribute to perceived openness and accessibility. The findings suggest that material expression should be treated as an important component of entrance threshold design, not merely as an aesthetic treatment. Design strategies that may support stronger invitation include high façade transparency for interior preview, clear threshold framing through canopies or structural articulation, and alignment with visible interior circulation or double-height spaces. Conversely, deeply recessed entrances or those visually blended with surrounding façade elements may weaken entrance recognition and perceived accessibility, especially in dense urban retail contexts such as Colombo, Sri Lanka.

6. CONCLUSIONS

This study examined how material expression at entrance thresholds relates to invitation to access by combining architectural observation, spatial visibility analysis, and perception-based evaluation. The research investigated the relationship between material articulation, spatial prominence, and perceived openness at the building edge. The findings show a consistent association between higher transparency, clear threshold framing, visible interior volume, and stronger invitation profiles. Entrances with greater visual continuity between exterior and interior spaces recorded higher spatial integration and stronger perceptions of openness and legibility. In contrast, recessed entrances with limited material differentiation and reduced interior visibility showed weaker spatial prominence and lower invitation scores. The study highlights material expression as an important architectural component of entrance threshold design rather than a purely

aesthetic treatment. Transparent glazing, visible interior preview, and clearly articulated threshold framing may support stronger perceived accessibility and spatial recognition during pedestrian approach. Overall, the study contributes a comparative perspective on the relationship between material expression, spatial visibility, and invitation to access within contemporary urban retail architecture.

7. REFERENCES

Abdelmonem, M. G. (2022). Fear in disguise: Defensive architecture and façade permeability in shaping the urban experience of Belfast's public spaces. *Architectural Research Quarterly, 26*(2), 148–160. https://doi.org/10.1017/S1359135522000392

Appleton, J. (1975). *The experience of landscape*. Wiley.

Arthur, P., & Passini, R. (1992). *Wayfinding: People, signs, and architecture*. McGraw-Hill.

Benedikt, M. L. (1979). To take hold of space: Isovists and isovist fields. *Environment and Planning B: Planning and Design, 6*(1), 47–65. https://doi.org/10.1068/b060047

Bitner, M. J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing, 56*(2), 57–71. https://doi.org/10.1177/002224299205600205

Coleman, P. (2006). *Shopping environments: Evolution, planning and design*. Architectural Press. https://doi.org/10.4324/9780080480909

Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing, 58*(1), 34–57.

Eco, U. (1986). Function and sign: The semiotics of architecture. In *Travels in hyperreality* (W. Weaver, Trans., pp. 181–202). Harcourt Brace Jovanovich.

Hillier, B. (1996). *Space is the machine: A configurational theory of architecture*. Cambridge University Press. https://discovery.ucl.ac.uk/id/eprint/3848/

Hillier, B., & Hanson, J. (1984). *The social logic of space*. Cambridge University Press.

Khomeiri, F., Pazhouhanfar, M., & Stoltz, J. (2025). The impact of architectural facade attributes on shopping center choice: A discrete choice modeling approach. *Buildings, 15*(17), Article 3161. https://doi.org/10.3390/buildings15173161

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. MIT Press.

Pallasmaa, J. (2005). *The eyes of the skin: Architecture and the senses* (2nd ed.). Wiley.

Penn, A. (2003). Space syntax and spatial cognition: Or why the axial line? *Environment and Behavior, 35*(1), 30–65. https://doi.org/10.1177/0013916502238864

Pijls, R., Groen, B. H., Galetzka, M., & Pruyn, A. T. H. (2023). Come in please: A virtual reality study on entrance design factors influencing the experience of hospitality. *Journal of Environmental Psychology, 91*, Article 102137. https://doi.org/10.1016/j.jenvp.2023.102137

Rapoport, A. (1982). *The meaning of the built environment: A nonverbal communication approach*. Sage.

Turner, A. (2004). *DepthmapX 4: A researcher's handbook*. University College London.