

Journal Home Page: <https://sjes.univsul.edu.iq/>

Research Article:

Architectural Landmarks and Urban Identity: A Perception Assessment for Place Meaning in Sulaymaniyah City

Raz Kamaran Radha^{1,a,*}
Raz Saeed Faraj^{2,a}

^a College of Engineering, Department of Architecture, University of Sulaimani, Sulaymaniyah, Kurdistan Region, Iraq

Article Information

Article History:

Received: July 28th, 2026

Accepted: September 4, 2026

Available online: December , 2026

Keywords:

Architectural landmarks; urban identity; public perception; place attachment; heritage conservation; Sulaymaniyah

About the Authors:

Corresponding author:

Raz K. Radha

E-mail: raz.kamaran@univsul.edu.iq

Researcher Involved:

Asst. Prof. Dr. Raz S. Faraj

E-mail: raz.faraj@univsul.edu.iq

DOI <https://doi.org/10.17656/sjes.10230>



© The Authors, published by University of Sulaimani, College of Engineering.

This is an open access article distributed under the terms of a Creative Commons Attribution 4 International License.

Abstract

Architectural landmarks shape how cities are recognized and remembered, yet little empirical evidence exists on how the public evaluates different landmark types, particularly in rapidly transforming Middle Eastern cities. This study aims to examine how selected architectural landmarks contribute to public perceptions of urban identity in Sulaymaniyah, Iraq, and to determine which attributes are most strongly associated with landmark recognition and preference. To achieve this aim, the study assesses public evaluations of seven landmarks spanning religious, hospitality, commercial, residential, and heritage types; examines how different landmark types contribute to urban identity; and compares structured evaluation with spontaneous public recall. A quota-based survey of 180 residents combined a structured evaluation across seven criteria with an unprompted recall task. Data were analyzed using the Friedman test, correlation, and principal component analysis. Amna Suraka received the highest overall evaluation, followed by the Grand Mosque. In contrast, the more prominent contemporary towers were recognized mainly for their visibility and usefulness in wayfinding rather than for representing the city's identity. The findings also point to two main dimensions of landmark perception: cultural meaning and everyday function. Spontaneous recall further showed that people's image of Sulaymaniyah extends beyond individual buildings to include the historic Old Bazaar and Azmar Mountain. Overall, the findings from the surveyed sample suggest that cultural meaning has a greater influence on how landmarks are valued in Sulaymaniyah than physical prominence alone. These results emphasize the necessity of taking into account local identity, collective memory, and heritage in future architectural and urban development.

1. Introduction

Cities are distinguished not only by their physical form but also by the identities they create through their built environments. Urban identity reflects the physical, cultural, historical, and social characteristics that enable residents and visitors to recognize and remember a city (Relph, 1976; Tuan, 1977). Architecture plays a central role in this process because buildings shape the visual image of urban environments and influence how people perceive, navigate, and emotionally connect with places

(Lynch, 1960). Architectural landmarks are often used to express urban identity because they connect people with a city's history, culture, and shared memory (Lynch, 1960; Zhang et al., 2024). Certain landmarks gain historical and cultural significance, while others are acknowledged only because of their design or visual presence. These different roles gain even more importance as cities wish to fortify their identity through urban design, heritage conservation, tourism and city branding (Kavaratzis & Ashworth, 2005; Al-

Betawi & Abu Ehmaid, 2025). Recent bibliometric evidence confirms that urban identity still is a multifaceted structure in which landmarks, heritage, and memory still form key elements in survey-based studies (Alesaily & Albialy, 2025). Sulaymaniyah serves as a key context for studying perceptions of architectural landmarks. The city pairs a historic core with fast-moving contemporary development, producing a mixed architectural landscape in which religious, heritage, commercial, residential, and hospitality buildings together shape how it is seen. Knowing how residents view these landmarks can help in evidence-based planning and future building projects.

1.2 Research Problem

Although architectural landmarks are widely recognized as important contributors to urban identity, it remains unclear which landmarks in Sulaymaniyah the public most strongly associates with the city's identity and which perceptual attributes — physical prominence or cultural meaning — shape that association. To date, no systematic multi-criteria public evaluation of selected architectural landmarks in Sulaymaniyah has been identified. As a result, decisions related to heritage conservation, contemporary landmark design, and the city's image may rely largely on professional judgment without sufficient empirical evidence of how residents perceive and value these landmarks. This study addresses this problem through a direct public evaluation of seven representative architectural landmarks.

1.3 Research Gap

While many studies have investigated landmark perception and urban identity, there are only a handful of them that have measured multiple types of architectural landmarks using both structured public assessment and spontaneous recall. Such limitations are particularly pronounced in fast-evolving Middle Eastern cities, due to the absence of empirical data. The few studies carried out in the Kurdistan Region of Iraq have concentrated on the morphology and authenticity of historic cores (Ibrahim et al., 2014, 2015), without comparing how the public perceives contemporary and heritage buildings (Surchi & Nafa, 2021). Outcomes of heritage conservation policies have only recently been assessed for some comparable sites in Baghdad and Mosul or the citadel of Erbil (Akram & Franco, 2025; Alobaydi et al., 2026), while public perceptions across mixed modern-heritage landmarks have not previously been contrasted.

1.4 Aim of the Study

This study aims to examine how selected prominent buildings contribute to public perceptions of urban identity in Sulaymaniyah, and to determine which attributes are most strongly associated with landmark recognition and preference.

1.5 Research Objectives

- To assess the public opinion towards some iconic architectural buildings in Sulaymaniyah.
- To differentiate the impact different types of landmarks have on urban identity.
- To determine which traits are the most statistically significant in landmark evaluation.
- To compare structured landmark evaluations with spontaneous public recall.
- To provide suggestions for urban planning, heritage preservation, and future landmark developments.

1.6 Practical Importance

The immediacy of defining which buildings shape perceptions of the public image a city conveys has consequences for architectural and planning practice. Evidence-based public perception can aid decisions on heritage conservation, contemporary landmark design, and even city branding in fast-growing cities, which often expand faster than public interest or opinion can be understood.

1.7 Methodological Approach

To address these aims, the study surveyed 180 adult residents of Sulaymaniyah using a quota-based field survey that combined an unprompted free-recall task with a structured multi-criteria evaluation of seven representative architectural landmarks. Data were analyzed using descriptive statistics, the Friedman test, Pearson correlation, and principal component analysis. Full methodological details are provided in Section 3.

1.8 Research Questions and Hypotheses

Central hypothesis. In Sulaymaniyah, landmark value is shaped more strongly by cultural meaning than by physical prominence, such that heritage and identity-bearing buildings are more strongly associated with urban identity than contemporary landmarks defined primarily by visibility or scale.

H1. Public evaluations differ significantly among the selected architectural landmarks.

H2. Historical and cultural significance are positively associated with higher overall landmark evaluations.

H3. Stronger perceptions of city identity are positively associated with higher overall landmark evaluations.

H4. Spontaneous landmark recall differs from structured landmark evaluation.

2. Literature Review

2.1 Urban Identity and the Image of the City

Urban identity refers to the distinctive character of a city that emerges from the interaction of its physical environment, culture, history, and social life, and from the meanings that residents and visitors attach to it (Relph, 1976; Tuan, 1977). It is widely treated as a multi-dimensional construct rather than a single

attribute: it is simultaneously material, expressed in built form, and symbolic, practiced and sensed by inhabitants (Norberg-Schulz, 1980). This multivalence is crucial for the present research as it suggests that the role a building plays in urban identity cannot be interpreted by investigating its physical appearance but needs to be assessed through public perception. A recent bibliometric review covering 1969–2024 confirms that urban identity is a multi-faceted construct built from landmarks, history, heritage, culture, and memory, and that survey-based approaches remain central to how it is studied (Alesaily & Albialy, 2025). Key text that provides an intellectual grounding for the analysis of the visual facet of city identity is *The Image of the City* by Lynch (1960), based on his thesis claiming that people possess a collective mental image representing their city built through five repetitive elements: paths, edges, districts, nodes, and landmarks. Lynch's idea of imageability, the potential of a physical feature to be imprinted in the mind of an observer, reoriented urban form such that it was judged by city users rather than the designer's plan. Most importantly, Lynch considered legibility a quantitative quality that could be measured and compared, thus setting a methodological benchmark for later survey- and multi-criteria-based studies of public perception of the built environment (Nasar, 1998). Recent work builds on this foundation while also challenging its boundaries; computational and street-view methodologies quantify a city's visual character at the scale of quotidian scenes, and some authors contend that identity emerges from familiar, constantly enacted place-making rather than iconic monuments (Guo et al., 2025). Advances in computer vision analysis of street scene imagery make this common visual identity quantifiable at city scale (Zhang et al., 2024), and generative modeling is beginning to compute place identity itself (Jang et al., 2024) — making the empirical question of which elements residents actually identify with more urgent, not less. This friction between landmark status and everyday context recurs throughout the literature and directly drives our pairing of more structured landmark evaluation with public recall. While Lynch describes the process by which certain elements of the city are perceptually recognizable and thus useful for orientation, Aldo Rossi's *The Architecture of the City* (Rossi, 1982) provides a complementary perspective on the persistence of urban identity through time. Rossi emphasized the significance of collective memory in the creation of the city, and identified certain urban artifacts and monuments as permanent elements whose significance can persist despite changes in their original function. In this sense, the significance of a landmark is a function not only of its visual prominence, but also of the historical and

cultural meanings that accrue to it. This difference is especially important for the present study. Lynch's concept of imageability helps explain why visually prominent and distinctive buildings may become recognizable elements of the city, whereas Rossi's emphasis on collective memory helps explain why historically meaningful places may remain central to urban identity even without dominating the skyline. Together, these views offer a theoretical basis for the study of the relationship between physical presence and cultural importance in the public image of the landmarks of Sulaymaniyah.

2.2 Landmarks, Legibility, and Cognitive Reference

Landmarks have a particular place among the five elements of Lynch's (1960) theory: they are external point-references around which people orient themselves and organize their mental image of the city. This account has been refined through subsequent research in cognition and computation. Haken and Portugali (2003) applied information theory to their interpretation of the image of a city, arguing that legible components are those carrying maximum amounts of information — meaning they are also most distinguishable from background environments — and associated imageability with Gibson's (1979) paradigm of affordances, which stipulates that environmental characteristics basically offer perception, memory, and action. We understand the salience of a landmark from this point of view to be determined by how prominently it contrasts with the background urban environment. A longstanding issue in this literature is that visual salience and perceived importance do not necessarily align. Furthermore, the status of a landmark rests just as much on subjective meaning as it does physical form, and so landmarks were consistently found to be the most difficult of Lynch's five elements to identify objectively. This has led researchers to differentiate between the structural salience of a landmark (its visibility and distinctiveness) and its cognitive or emotional salience (the meaning associated with it from experience). We operationalize this distinction by rating landmarks on physical criteria — visibility and architectural distinctiveness — alongside meaning-related criteria — historical/cultural significance and city identity — so that the two can be compared rather than merged.

2.3 Place Attachment and the Meaning of Landmarks

While Lynch provides an understanding of how landmarks are perceived, the literature on place attachment and place identity explains why some eventually become iconic. Place attachment describes the affective connection between people and meaningful places; Scannell and Gifford's (2010)

tripartite model — which defined a conceptual way to deal with the knowledge of place attachment and has been widely used in literature — structures it along three dimensions (the person dimension, psychological process, and place or environmental setting) and locates shared meaning as symbolic at its heart. Related constructs are place identity, which is defined as the inclusion of place in self (Proshansky, Fabian, & Kaminoff, 1983), and sense of place, which is an evaluative attitude toward a setting (Jorgensen & Stedman, 2001). And the evidence from four decades of research is clear: in an age of unprecedented mobility and globalization, places inspire deep attachments. Despite this, knowledge of these bonds remains fragmented across the field (Lewicka, 2011). This body of work is important for landmark evaluation because it suggests that buildings imbued with collective memory and cultural significance will have a higher value than those that are simply prominent. This prediction is indeed increasingly supported by empirical evidence. Based on a survey of landmark landscapes in Nanjing — a fast-urbanizing city that retains both historic and modern districts — Zhang et al. (2024) reported that landmark characteristics, function, and historical-cultural significance all strengthened residents' place identity. This effect was moderated by length of residence: the longer people had lived in the city, the stronger the bond. That result bears directly on the present study, which records how long respondents have been associated with the city and examines heritage sites whose value may rest on meaning rather than prominence. Cai et al. (2025) have since shown that embodied cognitive engagement with historic buildings strengthens place attachment and support for conservation, reinforcing the view that heritage landmarks acquire value through meaningful engagement rather than visibility alone.

2.4 Evaluating Landmarks: From Physical Prominence to Multi-Criteria Public Perception

One question that comes up again and again in methodological terms is how we should measure landmark value. Most studies on imageability emphasized physical and visual properties only, but a major body of environmental psychology research has maintained that people evaluate the built environment on several attributes. In his studies of the "evaluative image of the city," Nasar (1994, 1998) demonstrated that people do not evaluate buildings and urban scenes along a single perceptual dimension, but along multiple dimensions at once (including form, distinctiveness, and meaning); and it is these evaluations, not physical form alone, which contribute to representation. That provided the basis for evaluating landmarks based on multiple criteria instead of just a single global score. One of the crucial and still-unsettled debates in this literature is whether

that public impression is shaped more by visual prominence than cultural significance. Research on cognitive legibility is anchored in visibility and distinctness, while research on place attachment is rooted in historical and symbolic value. Recent evidence points to the notion that symbolic value often has a greater weight than physical scale, especially in historic cities. A second, connected debate is over whose evaluation counts. Heritage evaluation research again and again reports that specialists and the general public exhibit systematic disagreement, with experts preferring historic and technical value. The public, on the other hand, often prioritizes visual and experiential aspects of daily life. The gap we observe between public valuation of landmark features and expert-public value discrepancies makes a powerful case for grounding landmark assessment on public perception (as done here) rather than professional judgment alone. A multi-criteria design is also justified: only by isolating criteria like accessibility and public activity from historic value and city identity can a study show that the inherent historic nature of certain landmark types derives their values from different sources. Following this multi-attribute reasoning, Do and Do (2025) sorted urban identity into architectural, cultural, natural, green-blue infrastructure, and service dimensions in a questionnaire study of Da Lat, Vietnam. They found that residents draw on both built and non-built elements when forming perceived identity, which supports the present study's pairing of building evaluation with free recall.

2.5 Architecture, Iconic Buildings, and City Branding

In addition to using its buildings for wayfinding and place attachment, cities begin deliberately leveraging landmark architecture as part of their economic development strategies, or city branding. City branding grew out of product and place marketing into a field concerned with shaping and communicating a city's image to residents, investors, and tourists (Kotler, Haider, & Rein, 1993; Kavaratzis, 2004; Dinnie, 2004). Under this framework, architecture is considered one of the primary tools: legible towers, buildings that act as brand identifiers, condensing a city identity into an easily recognizable image (Muratovski, 2012; Castillo-Villar, 2016). The best-known case is the 'Bilbao effect', where Gehry's Guggenheim Museum helped turn a declining industrial city into a major tourist destination, prompting cities elsewhere to commission signature buildings in the hope of similar returns (Yildiz, 2018). This scholarship is critical rather than merely descriptive, and its debates matter for how landmark value is interpreted. As Sklair (2006, 2010, 2017) points out, much iconic architecture is intertwined with capitalist globalization and a "culture-ideology

of consumerism," so that many modern discourses on the icon reflect transnational capital and elite image-making rather than local identity. Ponzini and Nastasi (2016) likewise challenge the over-generalized narrative of the Bilbao effect, showing that such projects rarely reproduce Bilbao's outcomes and often sit awkwardly within their own urban contexts. This bottom-up critique is undergirded by an increasing body of resident-oriented research that investigates the phenomena of city branding and demonstrates how campaigns of image and imposed icons can very well take root as prominence without belonging (Boisen et al., 2018; Belabas, 2023). Kavaratzis and Ashworth (2005) and Kavaratzis and Hatch (2013) spell this out even more explicitly: if a brand is developed without meaningfully co-producing the identity it purports to represent, it will create a brand that is foreign both in-content and context. This argument has been supported in further works. Aydoghmish and Rafieian (2022) conducted a meta-synthesis of thirty years of city-branding literature. The authors conclude that branding can only work if it is tied to the realities of urban planning, and not as an image management exercise. Audouin (2022) showed how the situated context and the local actors' agendas influence branding outcomes. The first stream sees branded space as a product of planning and the urban imaginary (Bonakdar & Audirac, 2021), and the second sees city brands as socially constructed networks of meaning in which meaning occurs (Sevin, 2014). This field understands architecture-tourism-cultural identity interactions (Gönüllüoğlu & Arslan Selçuk, 2024). The relevance for the present study is self-evident: a landmark may score high on markers such as visibility or architectural distinctiveness, but not add much to the general character of a city. Only public assessment can reveal this discrepancy.

2.6 Heritage Versus Contemporary Landmarks

The theme of the juxtaposition of heritage and contemporary landmark architecture returns repeatedly in both the branding and the identity literatures. While historic buildings are well known to serve as cornerstones of collective memory, cultural continuity, and authenticity, contemporary landmarks are often seen as representing modernization, investment, and global aspiration (Sudjic, 2005; Sklair, 2017). The academic consensus is not on which is better, but on how successful cities navigate the two — building distinctive new landmarks without eroding the historical scaffolding that makes a city unique. Amman, Jordan, illustrates this risk clearly. In expert interviews, al-Betawi and Abu Ehmaid (2025) found that the city's most frequently cited contemporary icons were striking in form yet weak as identity symbols, because they read as "out of context" with the surrounding street-level fabric. Their conclusion — that acceptance of contemporary

landmarks depends on how they relate to local identity — leads directly to the question tested here: how do residents weigh heritage against contemporary architecture when both compete within the same skyline?

2.7 Landmark Perception in the Middle East and Iraqi Kurdistan

Research on landmark architecture and urban identity in the Middle East has grown alongside the region's rapid urban transformation. However, it remains dominated by the Gulf's spectacular high-rise icons and by qualitative or single-case studies. Analyses of Gulf branding describe how towers such as the Burj Al Arab and Burj Khalifa were deployed as deliberate instruments of place-making and global positioning, while critical accounts question their connection to local culture (Sklair, 2017; Ponzini & Nastasi, 2016). Studies of other Arab cities, such as Amman, extend this discussion to the friction between heritage identity and global architectural ambition (Al-Betawi & Abu Ehmaid, 2025). Across these contexts, however, empirical, quantitative, public-perception studies that compare multiple categories of landmarks within a single city remain scarce. More recent Iraq-focused work has examined conservation policy gaps in Iraqi cities (Akram & Franco, 2025) and the persistence of heritage in Baghdad's urban fabric (Alobaydi et al., 2026), yet quantitative, multi-criteria public-perception studies within a single city remain scarce. Within Iraqi Kurdistan specifically, existing scholarship has concentrated on Erbil and on questions of morphology and authenticity rather than on comparative public perception. Ibrahim et al. (2014, 2015) documented how post-war reconstruction and neoliberal urbanism reshaped Erbil's urban form, describing a built fabric caught between authentic traditional quarters and globally oriented modern districts. They concluded that urban identity and sense of place should inform design strategy. Surchi and Nafa (2021) appraised place identity through the tangible elements of Erbil's Citadel. This body of work establishes that identity is a live and contested issue in Kurdish cities caught between authentic historic quarters and globally oriented modern districts. This leaves two clear gaps: the work centres on a single historic monument or quarter rather than a mixed set of contemporary and heritage landmarks, and it seldom applies structured, multi-criteria public evaluation. Sulaymaniyah — a city layered with religious, heritage, commercial, and contemporary buildings — has received almost no such attention.

2.8 Research Gap and Synthesis

Taken together, the literature establishes four points that frame this study. First, landmarks are central carriers of urban identity. Nevertheless, their value comes from two rather distinct sources—physical

prominence and cultural meaning—that the perception literature increasingly treats as separate and that empirical work suggests do not always coincide (Lynch, 1960; Scannell & Gifford, 2010; Zhang et al., 2024). Second, because expert and public evaluations systematically diverge, and because branding-led icons can achieve prominence without local resonance, landmark value is best assessed through public perception across multiple criteria rather than through professional judgment or a single global rating (Nasar, 1998; Belabas, 2023). Third, the heritage–contemporary balance is a defining planning challenge for rapidly transforming cities, yet the evidence base for how the public actually weighs the two is thin. Fourth, this evidence gap is especially acute for the Middle East, and most acute for Iraqi Kurdistan, where research has focused on single historic sites rather than on comparative, citywide public evaluation, and where Sulaymaniyah, in particular, remains largely unstudied. The present study addresses these gaps directly. It evaluates seven representative architectural landmarks in Sulaymaniyah — spanning religious, hospitality, commercial, residential, and heritage typologies — through a structured, multi-criteria public survey. It complements that assessment with spontaneous public recall to test whether the city's image extends beyond its designed landmarks. In doing so, it offers, to the authors' knowledge, the first comprehensive, perception-based, multi-criteria evaluation of architectural landmarks and urban identity in Sulaymaniyah.

3. Materials and Methods

3.1 Research Design

This study used a cross-sectional, quantitative questionnaire to assess public perceptions of selected architectural landmarks in Sulaymaniyah. Adult residents were interviewed face to face under a quota-based sampling approach. The instrument combined two complementary elicitation formats — an unprompted free-recall section and a structured multi-criteria evaluation of seven predefined landmarks — allowing spontaneously recalled and explicitly evaluated landmarks to be compared directly.

3.2 Study Area

Sulaymaniyah, the second-largest city in the Kurdistan Region of Iraq, has an urban fabric made up of four overlapping layers: (i) a historic centre around the Old Bazaar and Salim Street; (ii) religious and cultural institutions; (iii) dense commercial districts; and (iv) a recent generation of high-rise and mixed-use developments competing within the same skyline (Figure 1). That combination makes the city a strong setting in which to ask which architectural landmarks the public most closely ties to its identity.

3.3 Landmark Selection

Table 1 demonstrates the seven landmark building

types representing the main structures characterizing Sulaymaniyah, including buildings originating from religious, hospitality, commercial, residential, and heritage/memorial categories. This choice ensured the evaluation was not biased towards any specific building type (Figure 2; Table 1). Selection followed four criteria. The first was that the landmark needed to be either a single building or an architectural complex in total, so respondents considered one bounded object instead of a district or area. Second, the set needed to cover major building types in the city - religious/civic, hospitality, commercial/retail, high-rise residential and heritage/memorial - so that no single category of use would dominate the comparison and both symbolic/community and functional buildings would be included. Third, the candidate had to be widely known across the city rather than just in one particular neighborhood. Fourth, the selection needed to include both historical and contemporary landmarks to enable direct comparisons between heritage-derived and modern expressions of urban identity. Applying these criteria directly resulted in the selection of seven landmarks. Architecturally, the final set captures contrasting expressions of Sulaymaniyah's built environment, ranging from religious and heritage architecture to contemporary high-rise hospitality, large commercial complexes, and residential development. Places that did not fall within the defined unit of analysis, such as districts, streets, parks, natural features, and other non-building elements, were not included in the structured landmark evaluation. They were not excluded from the study entirely, however, because the unprompted recall task allowed respondents to identify any place they considered important to the city. The selected landmarks represent the main architectural typologies considered in this study: one religious/civic landmark (Grand Mosque), two hospitality buildings (Grand Millennium Hotel and Sulaymaniyah Palace Hotel), two commercial complexes (Majidi Mall and Family Mall), one high-rise residential development (Sulaymaniyah Heights) and one heritage/memorial site (Amna Suraka). The Old Bazaar and Azmar Mountain were named repeatedly by residents but could not be treated as candidates, since the former is an urban district and the latter a natural landscape feature; neither is a single building. Their role as competing anchors is examined separately in Section 4.7.

3.4 Questionnaire

The survey was interviewer-administered through face-to-face interviews on tablet devices, in approved Sorani Kurdish, Arabic, or English translations, and took roughly 10–12 minutes to complete (Figure 3). After an eligibility screen and verbal consent, the interview proceeded in four stages. First, respondents answered unprompted free-recall questions before

any landmark name or image was shown, which limited cueing. Second, standardized photo cards of the seven candidate landmarks were presented in position-balanced order, and respondents reported their familiarity with each; landmarks a respondent had never seen in person were not rated. Third, respondents rated each familiar landmark on a five-point scale (1 = very weak, 5 = very strong, with a "cannot judge" option treated as missing) against seven criteria: Visibility (C1), Architectural Distinctiveness (C2), Historical/Cultural Significance (C3), City Identity (C4), Accessibility (C5), Public Activity (C6), and Tourism Appeal (C7). A single-item overall rating (C8) was collected last and held out of the seven-criterion composite. Finally, respondents answered comparative-choice questions and a demographic profile. The full question wording as administered is presented in Table 2. An Overall Landmark Score (OLS) was computed as the simple average of the seven criteria for each landmark. Equal weighting was adopted because there was no established theoretical or empirical basis for assigning different weights to the criteria in the context of Sulaymaniyah, and imposing unequal weights would have introduced researcher judgment into the assessment of which attributes matter most to the public. The OLS was therefore used as a transparent summary index rather than as a measure of a single latent construct. The seven criteria are also reported and analyzed individually in Section 4.4, allowing their distinct perceptual roles to remain visible alongside the composite score. Their good internal consistency (Cronbach's $\alpha = 0.79\text{--}0.87$) indicates that they are sufficiently related to support aggregation, while their underlying dimensional structure is examined separately through principal component analysis in Section 4.8. Pilot testing of the questionnaire was conducted ahead of fieldwork, and pilot respondents were not included in the analysis.

3.5 Sampling and Data Collection

Eligible respondents were adults (18+) with at least 12 months of lived experience, work, study, or regular visits in the city. A quota-based field survey was conducted across six urban zones (historic core, inner-city streets, commercial and mall areas, cultural and institutional areas, outer districts and transport nodes, and recreational areas) and four time blocks (weekday and weekend, daytime and evening), yielding 180 valid responses collected between 12 October and 28 November 2025.

3.6 Statistical Analysis

Descriptive statistics summarized respondents' evaluations. Differences among landmarks were assessed with the Friedman test, and relationships among evaluation criteria were examined with Pearson correlation and principal component analysis (PCA). Post hoc pairwise comparisons following the Friedman test were performed using Wilcoxon

signed-rank tests with Bonferroni adjustment for the 21 landmark-pair comparisons. Both prompted and unprompted responses were summarized using frequency distributions. Hypothesis H4 was examined descriptively by comparing the frequency distributions of unprompted free-recall responses with those of the prompted structured-choice questions. No inferential test was applied to this comparison because the free-recall task was open-ended and was not restricted to the seven candidate landmarks, whereas the structured-choice questions used a predefined candidate set. Statistical analyses were conducted in IBM SPSS Statistics 29, with significance set at $p < 0.05$.

4. Results

4.1 Respondent Profile

There were responses from 180 participants representative of a wide variety of ages, education levels, and types of suburb in Sulaymaniyah. The majority of respondents had a bachelor's degree and were long-term residents (> 10 years) in the city, ensuring familiarity with the landmarks being evaluated. Some 12% of respondents came from architecture, engineering, and other related design disciplines. Respondent demographics are presented in Figure 4.

4.2 Questionnaire Reliability

Each landmark had a high internal consistency with the seven-criterion scale (Cronbach's $\alpha = 0.79\text{--}0.87$), confirming that the Overall Landmark Score can be used as an acceptable summary measure.

4.3 Overall Landmark Evaluation

Amna Suraka received the highest Overall Landmark Score (4.16), followed by the Grand Mosque (3.80) and the Grand Millennium Hotel (3.74). Family Mall, Majidi Mall, and Sulaymaniyah Palace Hotel formed a second group with moderate evaluations, while Sulaymaniyah Heights recorded the lowest score (3.22). These results suggest respondents perceived the city's identity to be more closely associated with locations important historically and culturally than modern buildings mostly distinguished by height or conspicuous architecture (Table 3; Figure 5).

4.4 Evaluation by Criterion

The evaluation criteria uncovered some unique strengths based on the landmark type. This analysis indicated that Amna Suraka and the Grand Mosque had the highest scores for historical significance, city identity, and tourism attractiveness, indicating their roles as potent cultural symbols of Sulaymaniyah. The Grand Millennium Hotel recorded the highest scores for visibility and architectural distinctiveness, reflecting its prominent position in the skyline. Family Mall and Majidi Mall scored the highest in terms of accessibility and public activity, which indicated that they were common in daily life rather than being identified as significant urban symbols. Although the Grand Mosque recorded the lowest visibility score among the seven landmarks (2.97), its overall rating remained among the highest, suggesting that, within

the studied sample, cultural significance can outweigh physical prominence (Table 4; Figure 6).

4.5 Comparison of Overall Landmark Rankings

The Friedman test, conducted on the 122 respondents who provided ratings for all seven landmarks, indicated significant differences among the evaluated landmarks ($\chi^2(6) = 206.51$, $p < 0.001$, Kendall's $W = 0.28$). Post hoc pairwise comparisons were performed using Wilcoxon signed-rank tests with Bonferroni adjustment across the 21 landmark pairs. Amna Suraka was rated significantly higher than every other landmark, including the Grand Mosque (adjusted $p < 0.001$), confirming it as the most highly rated landmark in this survey. The Grand Mosque and the Grand Millennium Hotel were not significantly different from each other (adjusted $p = 1.00$), and both were rated significantly higher than the other four landmarks. Differences among the lower four landmarks were generally non-significant, with one exception: Family Mall was rated significantly higher than Sulaymaniyah Heights (adjusted $p = 0.006$). These comparisons therefore support three broad ranking levels, while also identifying one significant difference within the lower-ranked group.

4.6 Prompted Responses

When asked to choose a single landmark, respondents strongly favored Amna Suraka: half (90 of 180) named it as best representing the city's identity, and a clear majority chose it as the place to show a visitor (106) and as the first landmark that comes to mind (102). The Grand Mosque was the consistent second choice. Only for everyday orientation did the pattern change — the Grand Millennium Hotel was named most often as a directional and meeting reference (57), ahead of the malls — showing that the building people navigate by is not the building they identify with (Table 5).

4.7 Spontaneous Recall

Before seeing any list, respondents named the places that came to mind unaided — and their answers reached beyond the seven candidate buildings. The Old Bazaar (a district) was the single most-named "first place in mind" (41), ahead of Amna Suraka (31) and Azmar Mountain (a natural feature, 27). Among individual buildings, Amna Suraka again led the identity and visitor prompts even without cueing. These descriptive comparisons imply that the public image of Sulaymaniyah, in the sample studied, goes beyond individual buildings to historic urban spaces and natural landmarks. Thus, the findings indicate that the identity of the city is perceived as being shaped by the combined influence of architecture, urban form and landscape and not by individual landmark buildings.

4.8 Principal Component Analysis

Pearson correlations among the seven criteria (Figure 9) indicate that meaning-related criteria —

historical/cultural significance (C3), city identity (C4) — cluster most strongly and positively ($r = 0.68$); whereas visibility (C1) is inversely related to historical significance ($r = -0.12$). This pattern anticipates the two-dimensional structure revealed by PCA and parallels the criterion-level differences between landmarks shown in Figure 8.

Principal component analysis was conducted on the pooled respondent–landmark rating profiles ($n = 838$ complete profiles across the seven landmarks), using the correlation matrix of the seven standardized criteria; components were not rotated. Two components had eigenvalues above 1 (Kaiser criterion). The first component (eigenvalue = 3.08) explained 44.0% of the variance, and the second (eigenvalue = 1.50) explained a further 21.5%, giving a cumulative explained variance of 65.4%. Component loadings are reported in Table 6. The first component loaded positively on all seven criteria and most strongly on tourism appeal (0.80), city identity (0.75), architectural distinctiveness (0.73), and historical/cultural significance (0.61). It is therefore interpreted as an overall evaluative dimension dominated by the cultural meaning attached to landmarks. The second component was bipolar, contrasting visibility (0.68), accessibility (0.45), and public activity (0.35) with historical/cultural significance (−0.68) and city identity (−0.45), and is interpreted as a dimension separating everyday urban function from symbolic significance. The mean component scores of the seven landmarks are shown in Figure 10. Amna Suraka and the Grand Mosque occupy more meaning-oriented positions, while the malls, Sulaymaniyah Heights, and, on the second component, the Grand Millennium Hotel occupy more function-oriented positions. Results from the studied sample therefore suggest that landmark perception reflects both symbolic and functional dimensions, while the landmarks rated most highly overall are those with stronger cultural meaning.

5. Discussion

This study set out to examine how selected architectural landmarks shape public perceptions of urban identity in Sulaymaniyah and which attributes carry the most weight. The findings are consistent with the four hypotheses, although the hypotheses were not all assessed using the same analytical approach. Public evaluations differed significantly across the seven landmarks (H1), while the criterion-level and multivariate analyses indicated strong roles for historical–cultural significance and city identity in landmark evaluation (H2 and H3). H4 was examined descriptively: comparison of unprompted recall with the structured evaluation revealed a different pattern, with free recall prominently including places outside the predefined candidate list, particularly the Old Bazaar and Azmar Mountain. Taken together, these

findings reveal a consistent pattern in how respondents assign landmark value, which the sections below consider in relation to the literature.

5.1 The Primacy of Meaning: Why a Heritage Site Leads

Despite not being the tallest or most visible of the city landmarks assessed, Amna Suraka—a site dedicated to heritage and memorial—was rated highest. It relies on collective memory and shared cultural trauma—the same kind of symbolic, community-shared meaning that many consider to underlie the person–place bond, an idea grounded in place-attachment theory (Scannell & Gifford, 2010). The finding can also be interpreted through Rossi's (1982) concept of urban permanence and collective memory. Amna Suraka has retained a strong place in the city's public identity not because of its physical scale or visual dominance, but because of the historical meaning and shared memory associated with the site. The fact that it ranked first in every prompted comparative tier—city identity, showing a visitor, and first landmark in mind—is evidence not just of high evaluation but also of a cognitive prime for residents. This interpretation is consistent with recent empirical research. Zhang et al. (2024) found that the historical–cultural significance of landmark landscapes strongly influenced residents' place identity, and that the relationship grew stronger with length of residence. The present sample, made up largely of long-term residents, is therefore the population in which heritage-based bonds would be expected to be strongest. The finding supplies quantitative, multi-criteria confirmation of a relationship demonstrated mainly through qualitative work elsewhere.

5.2 The Grand Mosque Paradox: Identity Without Visibility

Although it recorded the lowest visibility score of the seven buildings, the Grand Mosque emerged as one of the leading identity landmarks. This apparent paradox fits landmark theory, which separates structural salience — how strongly a landmark stands out physically — from cognitive salience, the meaning and memory it carries (Lynch, 1960). The Grand Mosque scores low on the first and high on the second: it does not dominate the skyline, yet as a religious–civic institution it is woven into daily life and collective identity. The paradox is informative because it shows that the two dimensions of landmark value can move independently — something a form- or skyline-based approach would miss — and it supports the multi-criteria design of this study: had value been measured as a single aggregate impression, the reason for the Grand Mosque's standing would have stayed hidden.

5.3 Prominence Without Belonging: The Wayfinding–Identity Split

The Grand Millennium Hotel presents the reverse

pattern to the Grand Mosque: residents cited it frequently as a locational and meeting reference, yet it ranked only mid-table for identity — high structural salience, low symbolic salience. The two cases show that the building people navigate by is not necessarily the one they identify with; landmark value and landmark legibility are related but distinct. The principal component analysis further reflected this distinction. The first component represented an overall evaluative dimension dominated by cultural meaning, while the second contrasted everyday urban function with historical and symbolic significance. Hotels and malls occupied the functional pole, while heritage and religious landmarks occupied the meaning pole.

This reflects the critical branding literature, where modern-day icons visually dominate yet lack local resonance (Sklair, 2017). The nearby Grand Millennium Hotel and Sulaymaniyah Heights are both prominent, familiar landmarks that can be used to orient oneself locally, but which do not really serve as the symbols of the city. A similar trend occurred in Amman, in which residents rated modern icons impressive in shape but "out of context," and historically weak symbols of identity (Al-Betawi & Abu Ehmaid, 2025)—a conclusion that Sulaymaniyah's residents arrived at via a wholly different quantitative path. The similarity between the two cases suggests that, in rapidly transforming cities, contemporary landmarks may achieve functional recognition more readily than symbolic belonging, although this interpretation should be tested further across other urban contexts.

5.4 The Image Beyond Designed Landmarks

The gap between prompted and spontaneous responses is best read not as a failure of individual buildings but as a sign that Sulaymaniyah's public image does not reside in buildings alone. Given a cue list, respondents rated the seven selected buildings; in free recall they named a historic district (the Old Bazaar) and a natural feature (Azmar Mountain) among the first places that came to mind, ahead of most designed landmarks. This echoes Lynch's (1960) reminder that landmarks are only one of five image elements, working alongside districts, paths, edges, and nodes. Methodologically, the pattern also warns that studies built on a fixed list of preselected candidates risk mistaking the buildings chosen by researchers for the anchors residents actually hold.

5.5 Limitations

Several limitations qualify these interpretations. Note that the sampling basis was a non-probability quota in one city; thus, results only describe the achieved sample and the context of Sulaymaniyah city rather than a representative population on a statistical basis. We deliberately restricted the candidate set to seven individual buildings or unified complexes; the

prominence of the Old Bazaar and Azmar Mountain in spontaneous recall suggests that direct comparison among buildings, districts, and natural features is an important question this design could not settle. The assessment also measured perception at a single timepoint, while place-based bonds increase with association (Zhang et al., 2024). The results should therefore be read within Sulaymaniyah's particular cultural and historical context, which may differ from that of other cities.

6. Conclusions

This research combined a structured multi-criteria survey with spontaneous public recall to examine how seven selected architectural landmarks contribute to public perceptions of urban identity in Sulaymaniyah. Results from the studied sample suggest that cultural meaning plays a stronger role than physical prominence in shaping how these landmarks are valued.

- a. Amna Suraka and the Grand Mosque emerged as the strongest identity-related landmarks in the studied sample, despite neither being the tallest nor the most visually prominent. In contrast, several contemporary landmarks were valued more strongly for orientation and everyday use than for representing the city's identity.
- b. The findings suggest that landmark perception reflects both symbolic and functional dimensions. The principal component analysis identified an overall evaluative dimension dominated by cultural meaning and a second dimension contrasting everyday urban function with historical and symbolic significance. Spontaneous recall also extended beyond the predefined building list to include the Old Bazaar and Azmar Mountain, suggesting that perceptions of Sulaymaniyah's identity are shaped not only by individual buildings but also by elements of the wider urban fabric and landscape.
- c. To the authors' knowledge, this study provides the first perception-based, multi-criteria assessment of architectural landmarks and urban identity in Sulaymaniyah. Within the studied sample, the findings indicate that heritage, collective memory, and cultural meaning were more strongly associated with landmark value than physical scale alone. Methodologically, combining structured evaluation with spontaneous recall provided a broader view of the places that respondents associate with the city.
- d. The findings suggest that future architectural and urban planning decisions in Sulaymaniyah would benefit from greater attention to local identity, collective memory, and heritage, while also recognizing the role of districts, natural features, and everyday urban spaces in shaping perceptions of the city. City-branding efforts may similarly find greater resonance in the city's heritage assets than in

physical scale alone. Future research could test whether similar patterns are found in other cities such as Erbil, Duhok, and Kirkuk, and could use larger probability-based or longitudinal samples to examine how landmark perceptions change over time.

Declarations

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interests

The authors declare that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT Authorship Contribution Statement

Raz K. Radha: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. Raz S. Faraj: Supervision, Validation, Writing – review & editing.

Data Availability

The data supporting the findings of this study are available from the authors upon reasonable request.

Acknowledgments

The authors thank the residents of Sulaymaniyah who participated in the survey and the Department of Architecture, University of Sulaimani, for its support.

Generative AI and AI-Assisted Technologies

During the preparation of this work, the authors used ChatGPT / Claude to assist with language editing and to support the drafting and formatting of figures and tables. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the publication's content.

References

- [1] Akram, O. K., & Franco, D. J. (2025). Architectural heritage in urban context: Bridging the gap between legislation and application in Iraq's conservation policies. In G. Hayder, M. Fairuz Shahidan, & A. Ozcan-Buckley (Eds.), *Cities' identity through the art of urban spaces* (pp. 205–220). Springer. https://doi.org/10.1007/978-3-031-94821-3_16
- [2] Al-Betawi, Y. N., & Abu Ehmaid, H. B. (2025). Branding cities through architecture: Identify, formulate, and communicate the city image of Amman, Jordan. *Architecture*, 5(3), 50. <https://doi.org/10.3390/architecture5030050>
- [3] Alesaily, Z., & Albialy, A. (2025). Urban identity: A bibliometric review, 1969–2024. *Alexandria Engineering Journal*, 128, 724–746. <https://doi.org/10.1016/j.aej.2025.07.016>
- [4] Alobaydi, D., Albayati, R., & Albabely, S. (2026). Persistent heritage: Exploring pedestrian movement in old Baghdad with space syntax integration. In M. F. Shahidan et al. (Eds.), *Cities' identity: The innovative dialogue between art and architecture*. Springer. https://doi.org/10.1007/978-3-031-98708-3_28
- [5] Audouin, C. (2022). The role of multi-level governance in branding medium-sized cities: The case of Nantes, France. *Cities*, 123, 103577. <https://doi.org/10.1016/j.cities.2022.103577>
- [6] Aydoghmish, F. M., & Rafieian, M. (2022). Developing a comprehensive conceptual framework for city branding based on urban planning theory: Meta-synthesis of the literature (1990–2020). *Cities*, 128, 103731. <https://doi.org/10.1016/j.cities.2022.103731>
- [7] Belabas, W. (2023). Glamour or sham? Residents' perceptions of city branding in a super-diverse city: The case of Rotterdam. *Cities*, 137, 104323. <https://doi.org/10.1016/j.cities.2023.104323>
- [8] Boisen, M., Terlouw, K., Groote, P., & Couwenberg, O. (2018). Reframing place promotion, place marketing, and place branding — moving beyond conceptual confusion. *Cities*, 80, 4–11. <https://doi.org/10.1016/j.cities.2017.08.021>
- [9] Bonakdar, A., & Audirac, I. (2021). City planning, urban imaginary, and the branded space. *Cities*, 117, 103315. <https://doi.org/10.1016/j.cities.2021.103315>
- [10] Cai, S., Hu, Y., He, J., & Li, K. (2025). The impact of embodied cognition on place attachment and supportive behavior toward historic buildings in heritage sites: Exploring the moderating role of resident identity climate. *Frontiers in Psychology*, 16, 1702052. <https://doi.org/10.3389/fpsyg.2025.1702052>
- [11] Castillo-Villar, F. R. (2016). Urban icons and city branding development. *Journal of Place Management and Development*, 9(3), 255–268. <https://doi.org/10.1108/JPMD-03-2016-0013>
- [12] Dinnie, K. (2004). Place branding: Overview of an emerging literature. *Place Branding and Public Diplomacy*, 1(1), 106–110. <https://doi.org/10.1057/palgrave.pb.5990010>
- [13] Do, T. D., & Do, S. X. (2025). Shaping urban identity: How physical and non-physical factors influence resident perception. *SAGE Open*. <https://doi.org/10.1177/21582440251403740>
- [14] Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton Mifflin.
- [15] Guo, S., Jang, K. M., Kang, Y., Duarte, F., & Ratti, C. (2025). Urban visual uniqueness: A landmark-free framework to quantify a city's identity and distinctiveness from everyday scenes. *Computers, Environment and Urban Systems*, 122, 102351. <https://doi.org/10.1016/j.compenvurbsys.2025.102351>
- [16] Haken, H., & Portugali, J. (2003). The face of the city is its information. *Journal of Environmental Psychology*, 23(4), 385–408. [https://doi.org/10.1016/S0272-4944\(03\)00003-0](https://doi.org/10.1016/S0272-4944(03)00003-0)
- [17] Ibrahim, R., Mushatat, S., & Abdelmonem, M. G. (2014). Authenticity, identity and sustainability in post-war Iraq: Reshaping the urban form of Erbil City. *Journal of Islamic Architecture*, 3(2), 58–68. <https://doi.org/10.18860/jia.v3i2.2533>
- [18] Ibrahim, R., Mushatat, S., & Abdelmonem, M. G. (2015). City profile: Erbil. *Cities*, 49,

- 14–25.
<https://doi.org/10.1016/j.cities.2015.07.001>
- [19] Jang, K. M., Chen, J., Kang, Y., Kim, J., Lee, J., Duarte, F., & Ratti, C. (2024). Place identity: A generative AI's perspective. *Humanities and Social Sciences Communications*, 11(1), 1156. <https://doi.org/10.1057/s41599-024-03645-7>
- [20] Jorgensen, B. S., & Stedman, R. C. (2001). Sense of place as an attitude: Lakeshore owners' attitudes toward their properties. *Journal of Environmental Psychology*, 21(3), 233–248. <https://doi.org/10.1006/jevp.2001.0226>
- [21] Kavaratzis, M. (2004). From city marketing to city branding: Towards a theoretical framework for developing city brands. *Place Branding and Public Diplomacy*, 1(1), 58–73. <https://doi.org/10.1057/palgrave.pb.5990005>
- [22] Kavaratzis, M., & Ashworth, G. J. (2005). City branding: An effective assertion of identity or a transitory marketing trick? *Tijdschrift voor Economische en Sociale Geografie*, 96(5), 506–514. <https://doi.org/10.1111/j.1467-9663.2005.00482.x>
- [23] Kavaratzis, M., & Hatch, M. J. (2013). The dynamics of place brands: An identity-based approach to place branding theory. *Marketing Theory*, 13(1), 69–86. <https://doi.org/10.1177/1470593112467268>
- [24] Kotler, P., Haider, D. H., & Rein, I. (1993). *Marketing places: Attracting investment, industry, and tourism to cities, states, and nations*. The Free Press.
- [25] Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, 31(3), 207–230. <https://doi.org/10.1016/j.jenvp.2010.10.001>
- [26] Lynch, K. (1960). *The image of the city*. MIT Press.
- [27] Muratovski, G. (2012). The role of architecture and integrated design in city branding. *Place Branding and Public Diplomacy*, 8(3), 195–207. <https://doi.org/10.1057/pb.2012.12>
- [28] Nasar, J. L. (1994). Urban design aesthetics: The evaluative qualities of building exteriors. *Environment and Behavior*, 26(3), 377–401. <https://doi.org/10.1177/001391659402600305>
- [29] Nasar, J. L. (1998). *The evaluative image of the city*. Sage.
- [30] Norberg-Schulz, C. (1980). *Genius loci: Towards a phenomenology of architecture*. Rizzoli.
- [31] Ponzini, D., & Nastasi, M. (2016). *Starchitecture: Scenes, actors, and spectacles in contemporary cities*. The Monacelli Press.
- [32] Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (1983). Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology*, 3(1), 57–83. [https://doi.org/10.1016/S0272-4944\(83\)80021-8](https://doi.org/10.1016/S0272-4944(83)80021-8)
- [33] Relph, E. (1976). *Place and placelessness*. Pion.
- [34] Rossi, A. (1982). *The architecture of the city* (D. Ghirardo & J. Ockman, Trans.). MIT Press. (Original work published 1966).
- [35] Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology*, 30(1), 1–10. <https://doi.org/10.1016/j.jenvp.2009.09.006>
- [36] Sevin, H. E. (2014). Understanding cities through city brands: City branding as a social and semantic network. *Cities*, 38, 47–56. <https://doi.org/10.1016/j.cities.2014.01.003>
- [37] Sklair, L. (2006). Iconic architecture and capitalist globalization. *City*, 10(1), 21–47. <https://doi.org/10.1080/13604810600594613>
- [38] Sklair, L. (2010). Iconic architecture and the culture-ideology of consumerism. *Theory, Culture & Society*, 27(5), 135–159. <https://doi.org/10.1177/0263276410374634>
- [39] Sklair, L. (2017). *The icon project: Architecture, cities, and capitalist globalization*. Oxford University Press.
- [40] Sudjic, D. (2005). *The edifice complex: How the rich and powerful shape the world*. Allen Lane.

- [41] Surchi, Z., & Nafa, H. (2021). Appraisal of place identity through tangible elements of cultural features in Erbil City. *Civil Engineering and Architecture*, 9(7), 2528–2541.
<https://doi.org/10.13189/cea.2021.090736>
- [42] Tuan, Y.-F. (1977). *Space and place: The perspective of experience*. University of Minnesota Press.
- [43] Yildiz, E. (2018). The importance of iconic buildings for city image: Konya science center example. *ICONARP International Journal of Architecture and Planning*, 6, 461–481.
- [44] Zhang, F., Salazar-Miranda, A., Duarte, F., Vale, L., Hack, G., Chen, M., Liu, Y., Batty, M., & Ratti, C. (2024). Urban visual intelligence: Studying cities with artificial intelligence and street-level imagery. *Annals of the American Association of Geographers*, 114(5), 876–897.
<https://doi.org/10.1080/24694452.2024.2313515>
- [45] Zhang, F., Sun, X., Liu, C., & Qiu, B. (2024). Effects of urban landmark landscapes on residents' place identity: The moderating role of residence duration. *Sustainability*, 16(2), 761. <https://doi.org/10.3390/su1602076>

المعالم المعمارية والهوية الحضرية: تقييم إدراكي المجتمعي على المعالم ودلالة المكان في مدينة السليمانية،

العراق

المستخلص

تؤدي المعالم المعمارية دوراً محورياً في تشكيل الصورة الذهنية للمدن وتعزيز قابليتها للتعرف والتذكر، إلا أن الأدلة التجريبية المتعلقة بكيفية تقييم الجمهور لأنواع المعالم المختلفة ما تزال محدودة، ولا سيما في مدن الشرق الأوسط التي تشهد تحولات عمرانية متسارعة. تهدف هذه الدراسة إلى تقييم إدراك الجمهور لسبعة معالم معمارية في مدينة السليمانية، العراق، تمثل أنماطاً متنوعة تشمل المعالم الدينية، والضيافة، والتجارية، والسكنية، والتراثية. واعتمدت الدراسة على مسح ميداني قائم على أسلوب الحصص (Quota Sampling) شمل (١٨٠) مقيماً، وجمع بين تقييم منظم للمعالم وفق سبعة معايير ومهمة لاستدعاء المعالم من الذاكرة بصورة تلقائية. وحُلِّلت البيانات باستخدام اختبار فريدمان، وتحليل الارتباط، وتحليل المكونات الرئيسية. وأظهرت النتائج أن نصب ثامنة سوركة التذكاري احتل المرتبة الأولى في التقييم العام، تلاه الجامع الكبير، في حين تصدرت الأبراج الحديثة البارزة مؤشرات الظهور البصري وسهولة الاستدلال المكاني، دون أن تحقق المستوى ذاته في تمثيل الهوية الحضرية. كما بينت النتائج أن إدراك المعالم ينقسم إلى بُعدين رئيسيين هما: المعنى الثقافي والوظيفة اليومية، وأن الاستدعاء التلقائي للمعالم لم يقتصر على المباني المصممة، بل شمل أيضاً منطقة تاريخية وعنصراً طبيعياً بارزاً. وتخلص الدراسة إلى أن قيمة المعالم في مدينة السليمانية تتحدد بدرجة أكبر بما تحمله من دلالات ثقافية مقارنة ببروزها المادي، بما يوفر مؤشرات علمية يمكن أن يستفيد منها المخططون والمعماريون الحضريون والجهات المعنية بحماية التراث عند التخطيط للمدن التي تشهد نمواً عمرانياً متسارعاً.

الكلمات المفتاحية:

المعالم المعمارية؛ الهوية الحضرية؛ الإدراك العام؛ الارتباط بالمكان؛ الحفاظ على التراث؛ مدينة السليمانية.

Table 1. Selected landmarks and typology.

No.	Landmark	Typology
1	Grand Mosque	Religious/civic
2	Grand Millennium Hotel	Hospitality/high-rise
3	Sulaymaniyah Palace Hotel	Hospitality
4	Majidi Mall	Commercial / retail
5	Family Mall	Commercial / retail
6	Sulaymaniyah Heights	High-rise residential
7	Amna Suraka	Heritage / memorial museum

Table 2. Survey instrument: question wording as administered.

Stage	Code	Question wording
A — Unprompted recall (asked before any name or image was shown)	B1	Thinking only about a building or architectural complex, what is the first one that comes to mind when you think of Sulaimani?
	B2	What single place best represents the identity of Sulaimani to you?
	B3	What place would you show a first-time visitor before anywhere else?
	B4	What place do people commonly use as a meeting point or reference point in the city?
B — Familiarity gate (per landmark, photo cards)	F1–F7	For each candidate, which statement best describes your familiarity? (0 = never seen in person; 1 = seen in person but not close enough to judge fully; 2 = visited, entered, or experienced up close)
C — Landmark assessment (per familiar landmark; 1 = very weak to 5 = very strong; "cannot judge" = missing)	C1	From normal public routes, how visually prominent is this building in the cityscape?
	C2	How distinctive are its form, silhouette, materials or detailing compared with nearby buildings?
	C3	How strong is its historical, cultural, religious or symbolic significance?
	C4	How strongly does it represent Sulaimani's identity?
	C5	How easy is it for the public to reach and approach this building?
	C6	How much does it support public use, meeting, gathering or social activity?
	C7	How suitable is it to show a visitor as part of Sulaimani?
	C8	Overall, how strongly does this building function as a city landmark?
D — Comparative choices (familiar candidates only)	E1.1–E1.3	First-, second-, and third-ranked landmark
	E2	Which one candidate best represents Sulaimani's identity?
	E3	Which one candidate would you most want to show a first-time visitor?
	E4	Which one candidate is most useful when giving directions or locating yourself in the city?
	E5–E6	Main reason for the first-ranked choice (category and open response)
E — Respondent profile	A1–A9	Gender; age group; length of association with the city; residence area; Old Bazaar visit frequency; main travel mode; education; design-related profession

Table 3. Overall Landmark Score and ranking

Rank	Landmark	OLS	SD	n
1	Amna Suraka	4.16	0.49	174
2	Grand Mosque	3.8	0.65	179
3	Grand Millennium Hotel	3.74	0.61	168
4	Family Mall	3.45	0.65	178
5	Majidi Mall	3.4	0.68	175
6	Sulaymaniyah Palace Hotel	3.32	0.61	171
7	Sulaymaniyah Heights	3.22	0.64	151

Table 4. Mean rating by landmark and criterion (1–5)

Landmark	C1 Vis.	C2 Arch.	C3 Hist.	C4 Ident.	C5 Access.	C6 Activity	C7 Tourism
Grand Mosque	2.97	3.73	4.47	4.16	3.36	4.05	3.83
Grand Millennium Hotel	4.65	4.39	2.32	3.38	4.01	3.57	3.9
Sulaymaniyah Palace Hotel	3.45	3.18	3.07	3.18	3.83	3.42	3.2
Majidi Mall	3.86	3.25	2.06	2.96	4.26	4.29	3.33
Family Mall	3.95	3.42	1.98	2.83	4.21	4.45	3.41
Sulaymaniyah Heights	4.22	3.99	1.98	2.92	3.19	2.99	3.13
Amna Suraka	3.41	3.97	4.74	4.49	4.14	3.76	4.62

Table 5. Prompted single-pick choices (counts of 180)

Landmark	Represents identity	Show a visitor	Directions	First in mind
Grand Mosque	60	53	6	52
Grand Millennium Hotel	9	9	57	7
Sulaymaniyah Palace Hotel	7	3	10	7
Majidi Mall	9	4	38	6
Family Mall	3	5	33	2
Sulaymaniyah Heights	2	0	24	4
Amna Suraka	90	106	12	102

Table 6. Unrotated component loadings for the seven landmark-evaluation criteria.

Criterion	PC1	PC2
C1 Visibility	0.48	0.68
C2 Architectural Distinctiveness	0.73	0.12
C3 Historical/Cultural Significance	0.61	–0.68
C4 City Identity	0.75	–0.45
C5 Accessibility	0.63	0.45
C6 Public Activity	0.58	0.35
C7 Tourism Appeal	0.80	–0.18
Eigenvalue	3.08	1.50
Variance explained (%)	44.00	21.50
Cumulative (%)	44.00	65.40

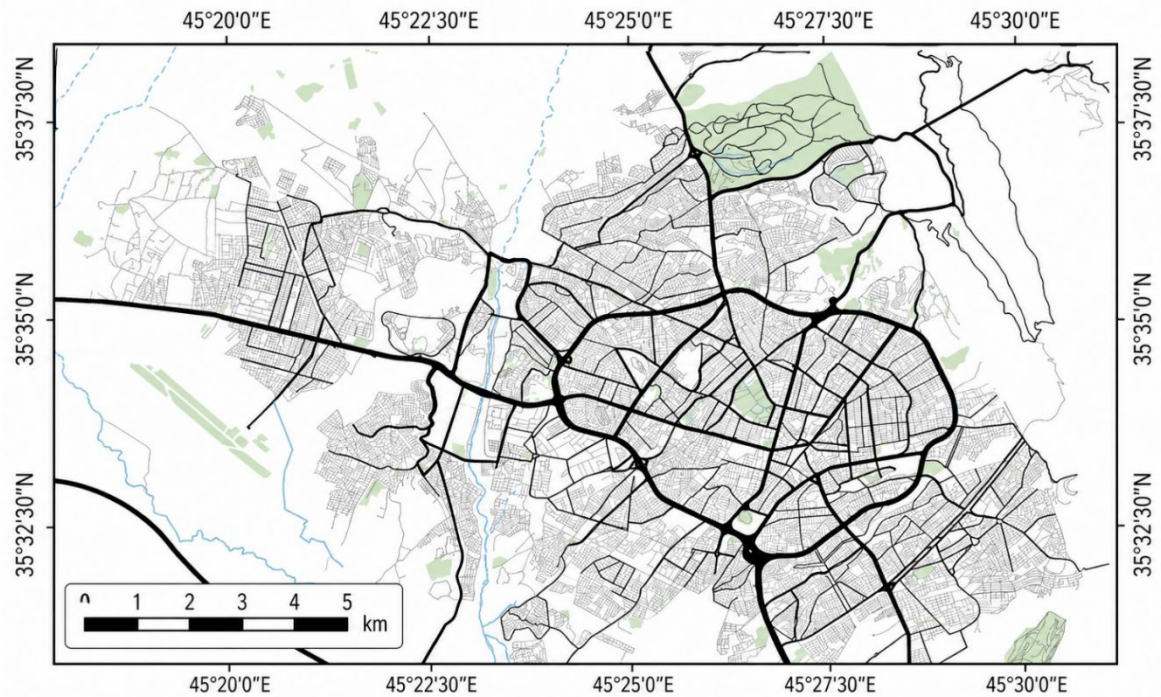


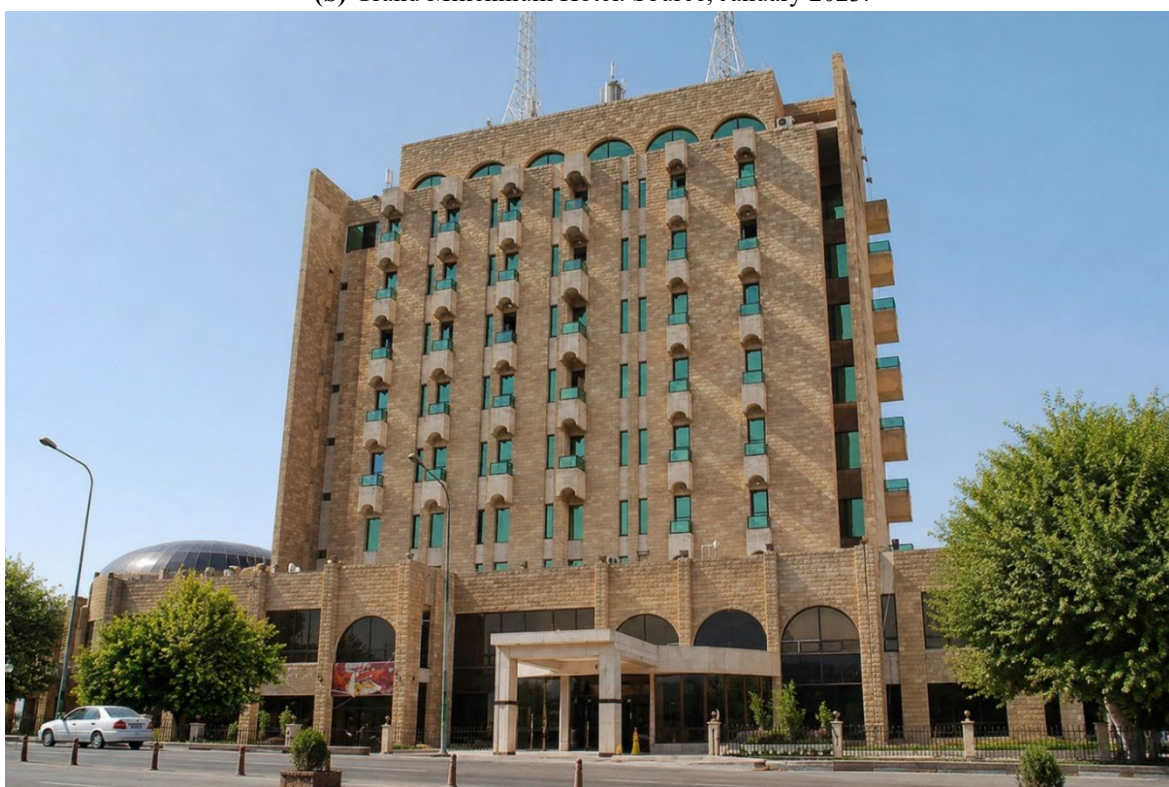
Figure 1. Study area map, Sulaymaniyah, Iraq, coordinate system: WGS 84/UTM Zone 38N (EPSG:32638), data source: © OpenStreetMap Contributors (ODbL), Overpass API extract, 15 Jul 2026, Map Date: Jul 2026, Scale = 1:144,000 (at 170 mm print width).



(a) Grand Mosque of Sulaymaniyah. Source, January 2026.



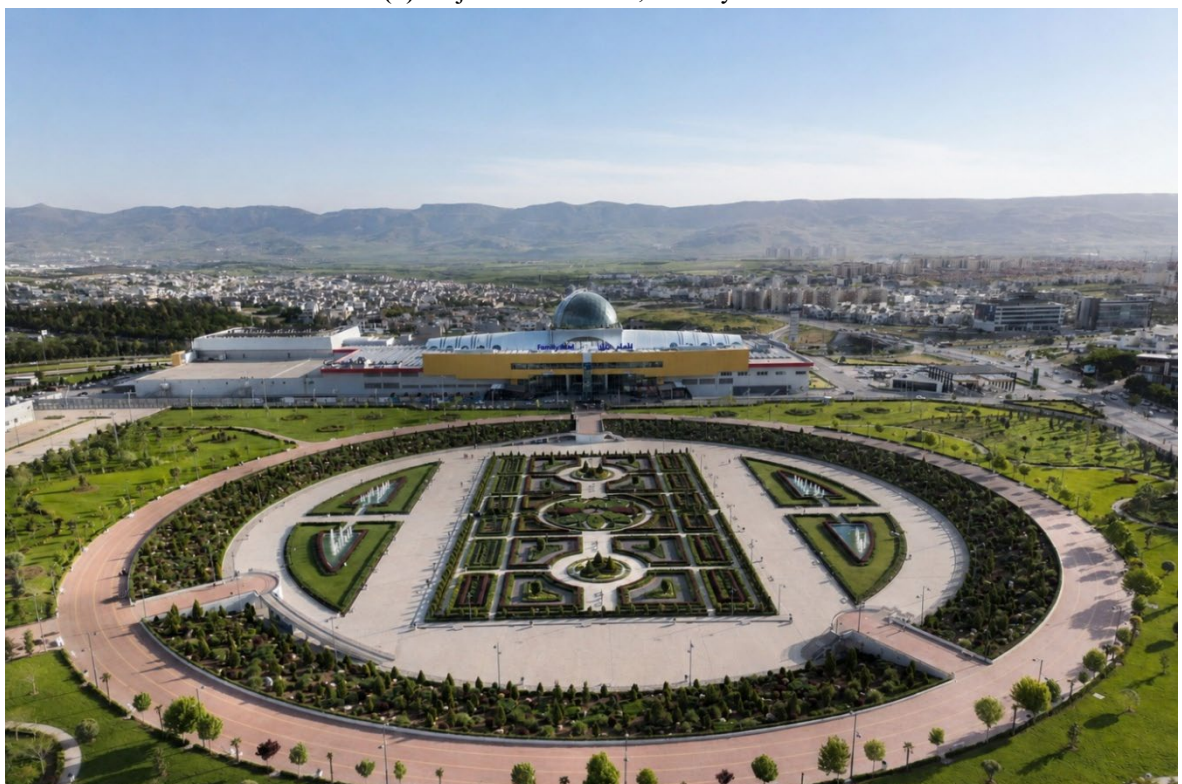
(b) Grand Millennium Hotel. Source, January 2023.



(c) Sulaymaniyah Palace Hotel. Source, Oct 2015.



(d) Majidi Mall. Source, January 2026.



(e) Family Mall. Source, January 2026.



(f) Sulaymaniyah Heights. Source, July 2024.





(g) Amna Suraka. Source, January 2014, 2026.

Figure 2. The seven selected landmarks (a–g), one panel per building, in the order of Table 1.

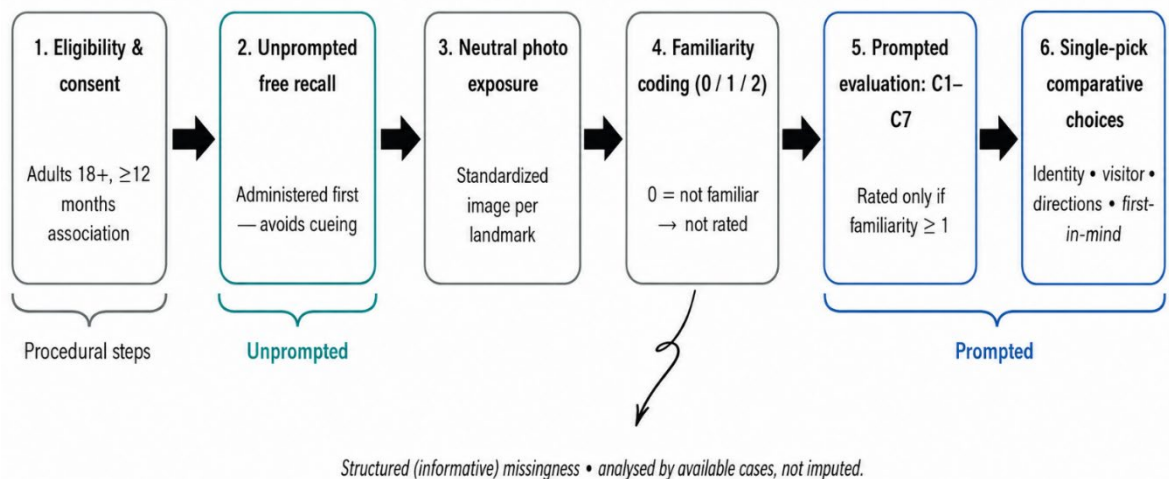
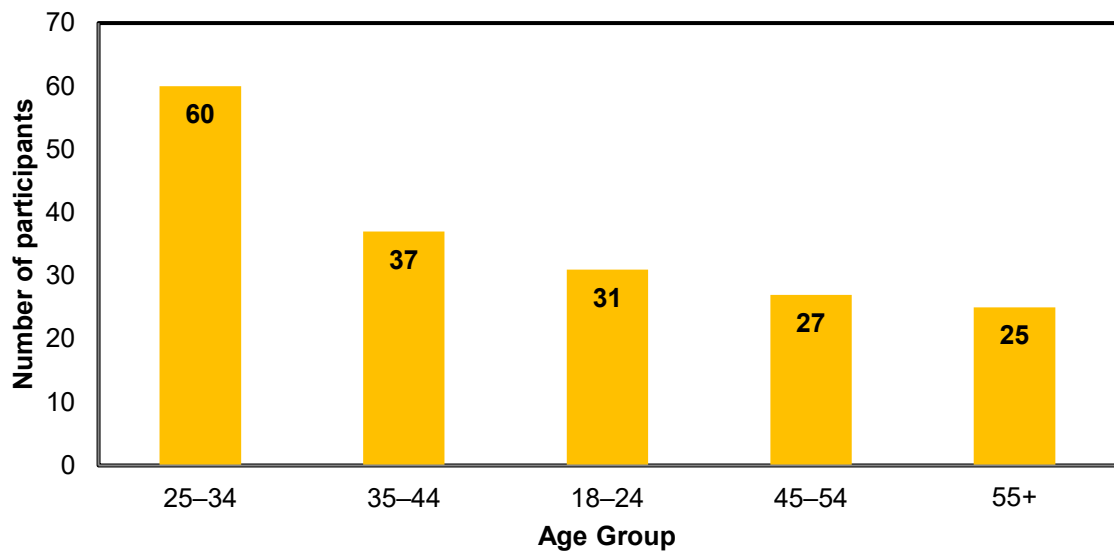
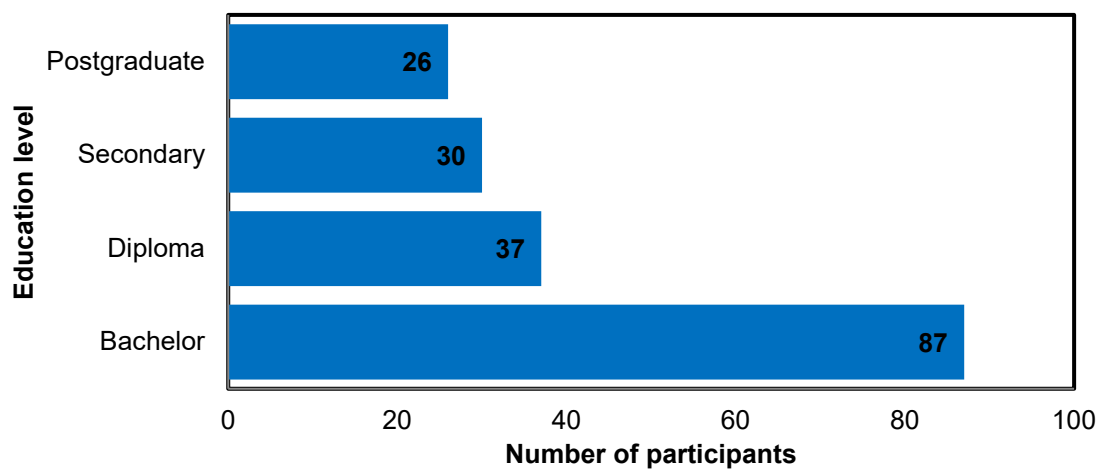


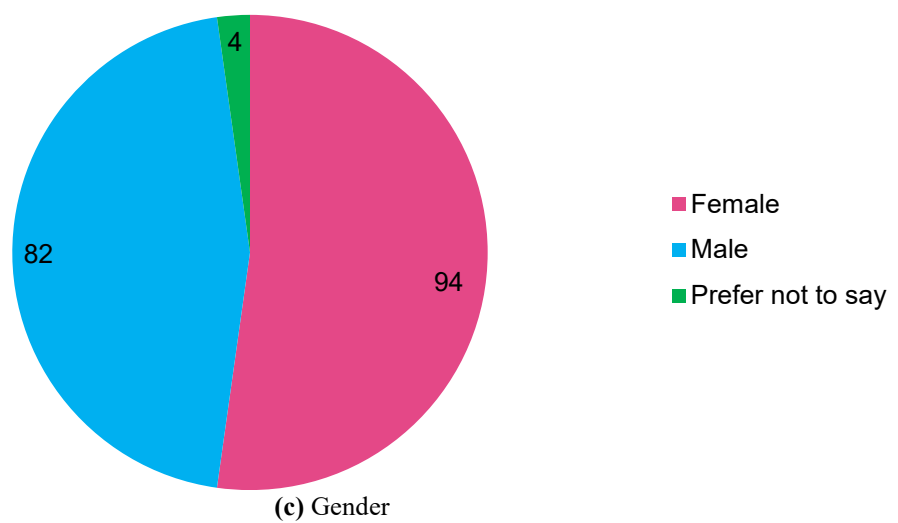
Figure 3. Questionnaire administration workflow.



(a) Age



(b) Education



(c) Gender

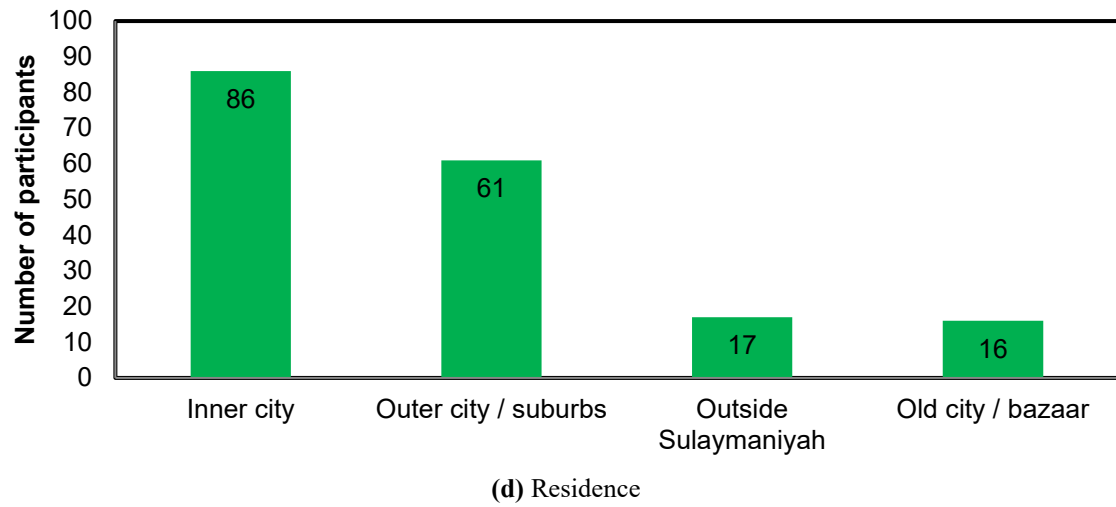


Figure 4. Respondent demographics.

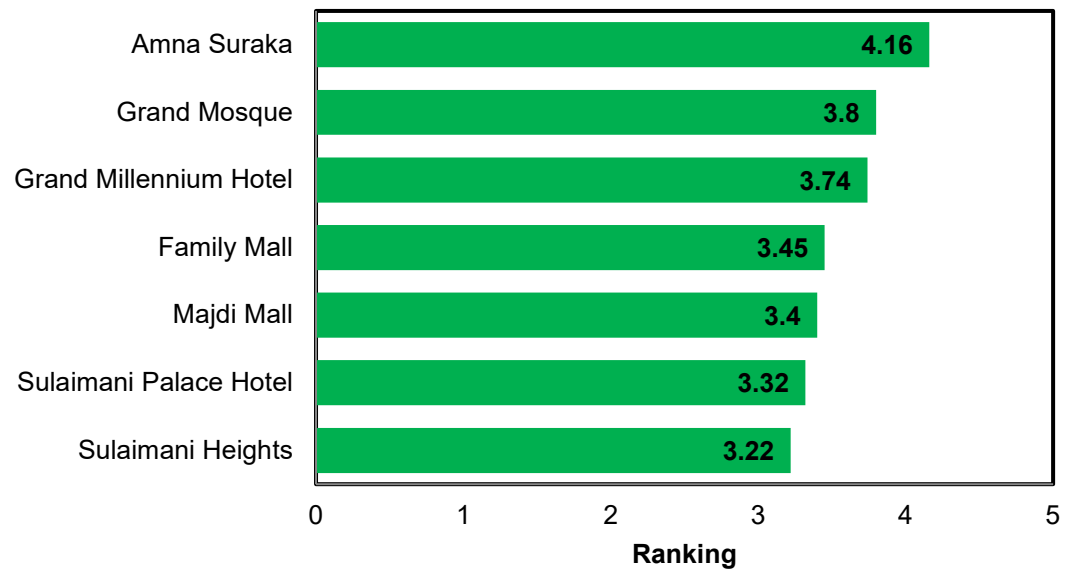


Figure 5. Overall Landmark Score ranking.

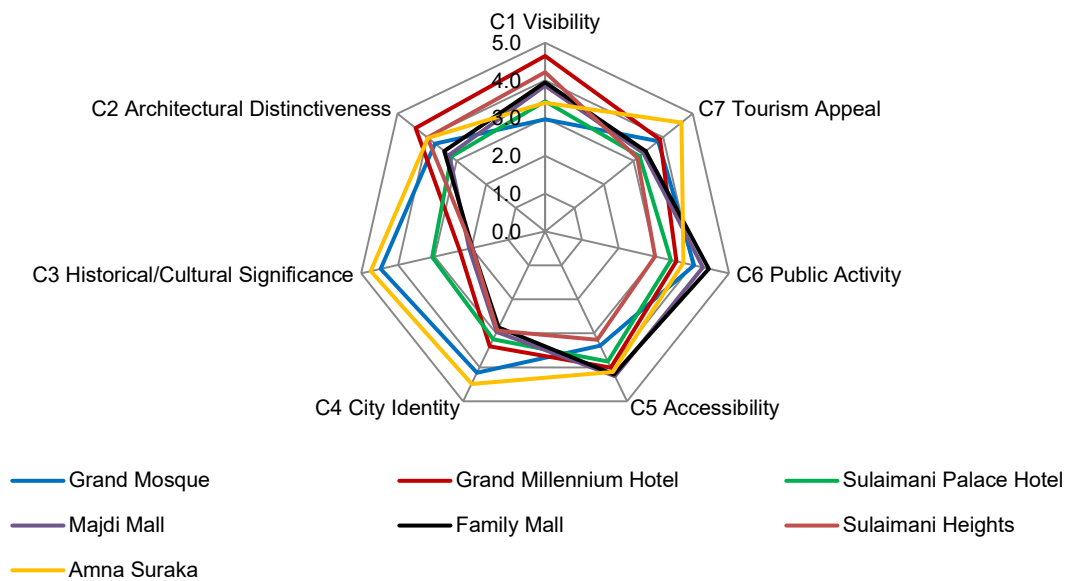


Figure 6. Radar: landmark criterion profiles.

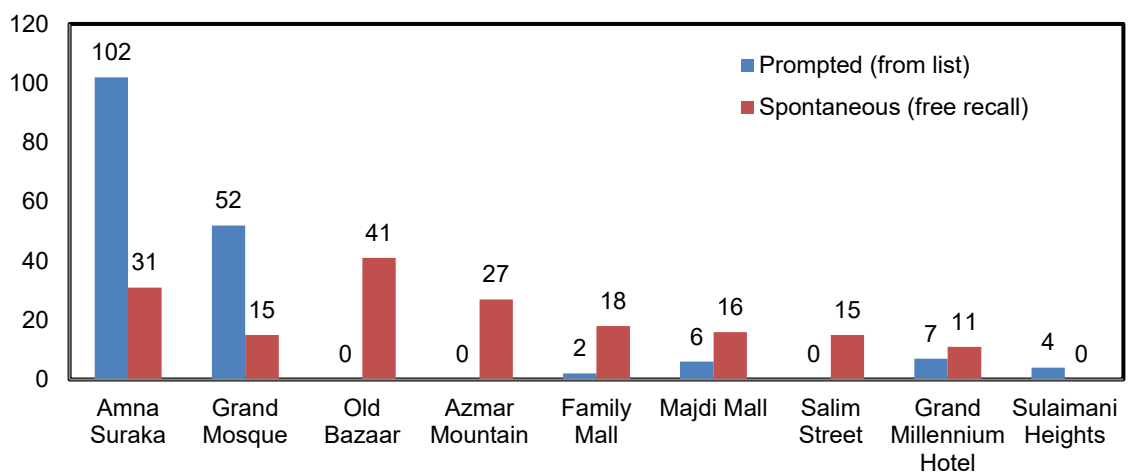


Figure 7. Prompted versus spontaneous recall.

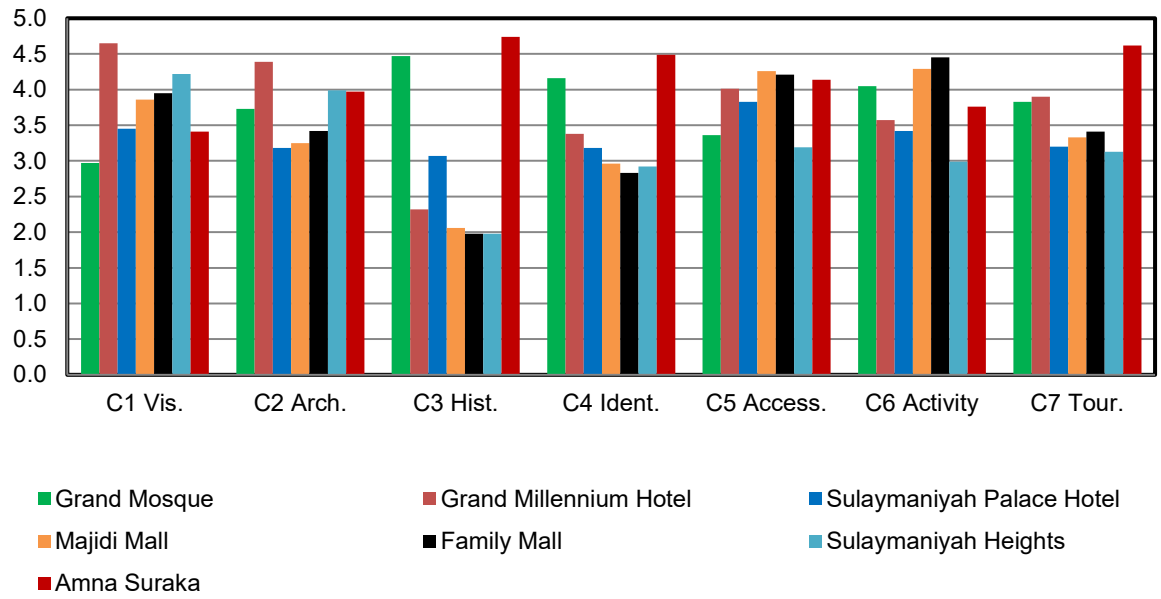


Figure 8. Criterion comparison across landmarks.

	C1	C2	C3	C4	C5	C6	C7
C1	1	0.43	-0.12	0.1	0.42	0.32	0.28
C2	0.43	1	0.3	0.45	0.35	0.29	0.49
C3	-0.12	0.3	1	0.68	0.11	0.17	0.55
C4	0.1	0.45	0.68	1	0.27	0.26	0.55
C5	0.42	0.35	0.11	0.27	1	0.47	0.38
C6	0.32	0.29	0.17	0.26	0.47	1	0.32
C7	0.28	0.49	0.55	0.55	0.38	0.32	1

Figure 9. Criterion correlation heat map.

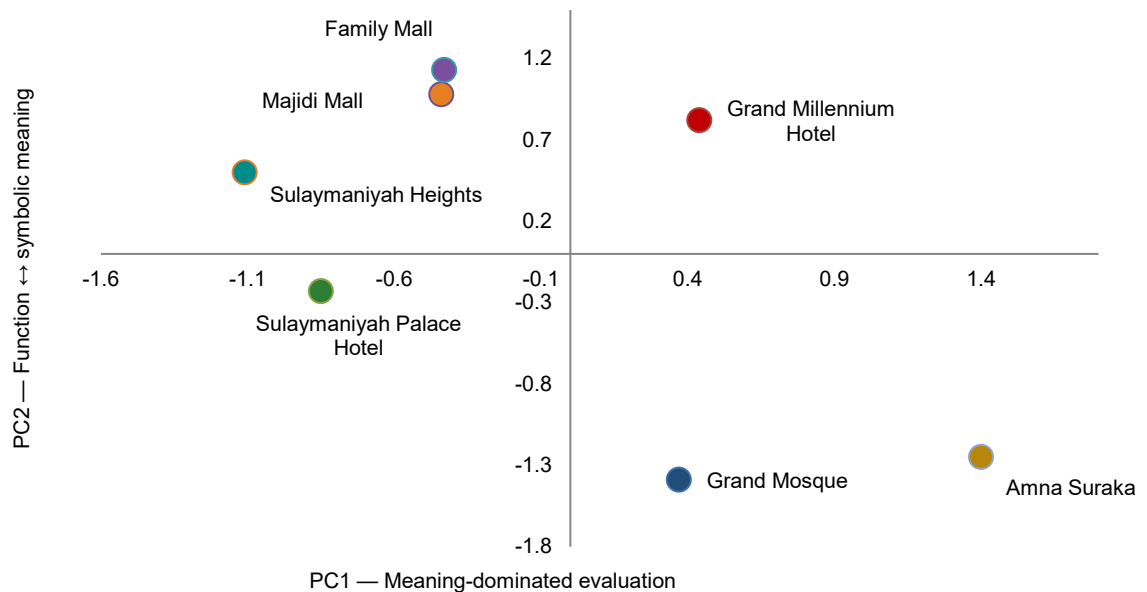


Figure 10. Principal component analysis map of the seven landmarks.