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

Research Article:

Urban Visual Characteristics and Livability of Heritage Areas: A Case of Erbil's Qaysari Bazaar

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Article Information

Article History:
Received: December 15th , 2025
Accepted: March 13, 2026
Available online: April , 2026

Keywords: Urban visual characteristics, Livability, heritage areas, Qaysari Bazaar, Erbil city.

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DOI https://doi.org/10.17656/sjes.10208

Abstract

Improving visual characteristics in heritage areas enhances residents' comfort, social engagement and overall urban livability. This study investigates how urban visual characteristics influence the perceived livability of the heritage area surrounding Qaysari Bazaar in Erbil City. The study employs a survey approach, incorporating a questionnaire. Findings reveal that urban visual characteristic shape residents' and users' perception of livability, with building façade characteristics and streetscape features showing the strongest influence. The regression result confirms that visual characteristics accounts for more than 70% of the variance in perceived livability, highlighting the critical role of architectural design, historical integrity, adequate greenery, and well-maintained public areas. The survey findings show that building façade characteristics play a larger role in livability compared to streetscape features and services. The study concludes that enhancing visual harmony, conserving heritage character, and improving pedestrian-friendly environments are essential strategies for sustaining livability of heritage areas. By empirically investigating the relationship between visual characteristics and perceived livability, the study critically highlights conservation methods and strategies that focus solely on material conservation and advocates for a transition to human-centered and visually-aware heritage management. The findings target planners, architects, and heritage authorities to adopt context-sensitive design guidelines to ensure sustainable urban conservation of Erbil.

1. Introduction:

A city's visual character strongly shapes perceived quality, human connection and livability (Rossi, 1984). Well-designed urban areas are where elements are preserved to strengthen cultural identity and support social interaction, as human perception is shaped by spatial pattern, legibility, visual sequence, and emotional responses to build form (Gehl, 2011). The development of visual characteristics evolved from early aesthetic principles (SITTE, 1889) to modernist functionalism (Rabaça, 2016), it explains how modern design uses visual uniformity, repetition, and simplicity to create a new city image and later human centered approaches (Lynch, 1960; Alexander, 1977), showing that building facades, streets, public spaces, and landmarks shape how people feel in place as these strongly argue visual qualities of places (Radha, 2025). Therefore, the existing urban visual characteristics, both heritage buildings and historic streets are regarded essential. For Jacobs (1961) livable urban environments rely on intricate, active streets, mixed use, human-centrality, visual diversity and functional integration, which are essential for comfort, safety, social cohesion and urban vitality. While to (UNWIN, 1909), careful and thoughtful

planning including the design of streets and buildings, use of material, aesthetic qualities and community-oriented spaces, is essential for creating livable and socially connected cities. Protecting heritage helps historic areas work together and maintain their physical condition, which in turn affects their visual characteristics (Al-Barzngy, 2022). Spence (2020) highlights how emotional and psychological connections to visual elements such as unique architecture, historic features, or natural areas enhance people's attachment "Sense of place" to their surroundings. When places evoke positive emotions, nostalgia, or cultural resonance, they are more likely to be valued and protected. Heritage conservation frameworks emphasize authenticity, harmonious integration of new and old structures and protection against inappropriate development (Prusina, 1995). In order to preserve the architectural character and historical value of heritage places, coordinated planning and management are crucial (Seth, 2023). For this, consistent building form, design, proportion, material, landscaping, scale, and setbacks which together create a harmonious and cohesive urban environment (Ewing, 2013).

2. Literature Review:

There are common issues that heritage areas deal with, such as; visual disharmony, loss of continuity, and weak proportions, the solutions could be: local materials, better-faced design, architectural hierarchy, improved visual quality leads to stronger livability and urban identity in heritage areas (Bahar, 2022). Furthermore, key heritage challenges such as visual chaos, unorganized interventions, land-use changes and loss of traditional identity confirm that improving visual identity, mental image and sense of place strengthen urban clarity and heritage value as well as residents' well-being. Where solutions such as urban sustainability standards, conservation, adaptive reuse, maintenance, and community participation; these are essential drivers of livability in traditional urban centers (Rabee Jameel Al-Shammari, 2024). Aldelphi (2019) focuse on visual sustainability in heritage renewal; contrasting color and inappropriate modern interventions can weaken heritage visual integrity and visual comfort, while architectural details such as facade ornaments and murals enhance visual attraction and positive perception, as buffer zones help maintain visual harmony and comfort, confirming a strong link between visual perception and heritage identity (Aldelphi, 2019). Later (Liu, 2022) identifies "attractiveness, identity, and legibility" as key livable factors, and physical elements "façade detail, building age/conditions, street layout, landscape and views" to imageability (Alamoush, 2022). While (Utaberta, 2012) links building facade visual elements, including color, shape, design and coordination between old and modern architecture, to the historical image of the city.

In historical streets, visual quality depends on a balance of authenticity, maintenance, natural elements, and coherence of architectural character (Farhan, 2020). To (Mundher, 2022) visual quality in historic urban environments is the extent that generates the positive or negative response among people, the visual quality of historical street scenes is a critical factor influencing quality of life in urban areas that maintain historical authenticity and could contribute positively, while inconsistent modern facades, physical degradation, and visual clutter detract significantly from the perceived quality and public satisfaction. This is in line with (Sabah, 2015), who views traditional urban architecture and streets design principles support livability by street functionality, emphasizing coherence and conservation of cultural identity. According to (Jamil, 2022) preserving and enhancing heritage districts is essential for livability, as his research shows visual connectivity and static street activity strongly improve livability and sociable environments, while architectural choices and their visual coherence directly influence visual appeal and functionality of urban commercial streets (SANTOSA, 2013). Well-preserved historic streets enhance architectural integrity, economic vitality and strengthens collective memory as well as the establishment of community security, which creates essential conditions in cities by generating positive social bonds and improved urban living conditions (Ahmed Mosa, 2022). Also (Ali, 2025) argues that well-designed commercial streets can enhance likeability and economic vitality through social interaction, attractiveness, and vitality. To (Shehab El-Deen, 2024) a revitalized heritage commercial street may contribute to urban quality of life by being more usable, pleasant social and can enhance livability by making it attractive and boosting economic activity and supporting vibrant businesses in the area, so preserving historical

elements, such as facades and signs, maintains authenticity and protects community character. The growing emphasis on heritage conservation and its effects on urban visual quality, strengthened by regeneration strategies of the city using an integrated approach which combines social, economic, physical, and environmental factors as this leads to livability (Haque, 2024). To (Keleş, 2018), high visual landscape quality enhance aesthetic satisfaction and support heritage conservation, where (Nia., 2021) finds that urban aesthetics positively enhances spatial vitality, and user engagement. However, (S. Treija, 2020) points out that preserving buildings alone does not sustain functional use with population decline and socio-economic changes reducing vitality. As livability in a community depends on residents need with facilities and with age-specific preferences being key factors (Liang, 2020). Meanwhile, visual preferences in historic areas guide effective conservation (Meysam Deghati Najd a, 2015). Although according to (Seth, 2023) heritage conservation enhances livability, (Vîlcea, 2023) shows that heritage perception and factors such as musealization and community engagement influence cultural identity through the appearance of streetscape in historic urban areas. (Ahmed, 2019) assesses livability by emphasizing on human centered design and how urban, visual features influence comfort and satisfaction. Furthermore, urban design promotes social livability by emphasizing public spaces and revitalization with strategic planning for sustainable and livable cities (Furlan, 2016).

Livability is multi-dimensional and defined by both tangible and intangible elements, such as good-quality design, building material, place identity, and accessibility. It is not limited to aesthetic or physical aspects but includes functional and symbolic interpretations of a place's elements, which evolve as society changes, as livability refers to the degree to which an environment supports residents' wellbeing, health, and life satisfaction and quality (Sepe, 2017). Livable areas are aesthetically pleasing, safe, cost-effective, and harmonious, emphasizing the preservation of the built physical environment and heritage as a core to livability (Ahmed Mosa, 2022; Haque, 2024) and supports social interaction and sustainability through thoughtful urban design, pedestrian zones and community areas to encourage public participation and meaningful social relations. According to the previous related literature, it was found that studies that evaluate and assess the visual characteristics of heritage areas in Erbil city in terms of livability are scarce. Accordingly, this research aims to assess the impact of urban visual characteristics on livability in heritage areas.

1.2. Operational definitions:

Heritage, refers to object or activities that hold particular significance for people, often linked to their identity and history and other forms of cultural expression that are valued by communities (Prusina, 1995). Heritage is perceived to be a process of change, where past architecture frames present architecture which forms the heritage of tomorrow, where preserving it is essential in maintaining historical integrity (Heritage, 1975). While (Šćitaroci, 2019) defines heritage as cultural and urban asset that carries historical, cultural, identity, memory and landscape values, which should be protected and integrated into sustainable urban development, whereas (Harrison, 2010) defines it as inherited property or historical and cultural assets passed down from previous generation that are worthy of preservation.

Urban Visual Characteristics, this study covers seven key urban visual characteristics consisting of two domains; first domain is ***building facade characteristics BFC*** (Architectural design and visual harmony, architectural integrity and cultural landmark presence, material unity), and second domain is ***streetscape features and services SFS*** (walkability, street furniture, maintenance and cleanliness, and green spaces and environmental quality).

Livability, covers nine ***livability factors***, including (sense of place/ identity, place attachment, health and wellbeing, safety and comfort, perception of happiness and environmental satisfaction, accessibility, economic vitality, and environmental satisfaction, community engagement and availability of services, positive and negative visual quality).

1.3. Research Gap:

While numerous international and local studies have examined the relationship between visual quality and livability, most have focused on either general urban areas such as commercial streets (Ali, 2025) or residential zones (Liang, 2020). Others evaluated aesthetic visual quality locally, while livability in heritage contexts was not the

focus of the study (Mundher, 2022). Therefore, a comprehensive framework to assess how combined urban visual characteristics in heritage areas shape residents' perceptions of livability is yet to be developed. While the interest in urban livability has increased over years and existing studies tend to concentrate on heritage or historic urban areas, urban livability, visual quality and urban aesthetics. There remains an underexplored gap of research addressing how urban visual characteristics impact livability across local heritage areas in Erbil city.

3. Research Problem:

Urban livability is closely tied to the design and visual characteristics of public spaces, particularly in heritage areas where historic and cultural significance must be preserved. Prior studies show that poor urban planning, limited community engagements, and insufficient quantitative data hinder efforts to create livable environments. Specifically, (Mundher, 2022) state that "more research is required to measure visual quality of historical street scene". Therefore, visual characteristics and livability in heritage areas of Erbil city in general is questioned. Existing research lacks comprehensive insights into how urban visual characteristics impact livability, effective strategies that balance conservation with livability, accordingly, the selected area is to be investigated to explore the extent to which these visual characteristics of heritage areas affect the livability. The main problem is the scarcity of local studies on the impact of urban visual characteristics on livability in the heritage areas of Erbil city that could lay the basis for the ongoing development.

3.1 Research Aim:

The aim of this research is to investigate how urban visual characteristics impact livability by examining their interplay in heritage areas. It seeks to identify urban visual characteristics that contribute positively or negatively to livability, explore participants perceptions and propose strategies to create inclusive, visually appealing urban environments that respect cultural heritage and conservation while accommodating future developments. And the collective impact of these visual characteristics on the lived experience in a heritage areas. This involves understanding how to balance conservation with current local need to improve quality of life while maintaining cultural and historical values.

3.2 Research objectives:

1. To identify how urban visual characteristics contribute to livability in heritage areas.

2. To analyze which urban visual characteristics influence visual quality and livability in heritage areas.

3. To explore different stakeholders' perceptions of urban visual characteristics in heritage areas, and how these perceptions impact their sense of livability.

4. To propose strategies for improving livability by fostering an inclusive, welcoming, visually appealing heritage environments.

3.3 Research questions:

Main Research Question:

1. To what extent do urban visual characteristics affect the livability in heritage areas?

Sub-Research Questions:

2. How do building façade characteristics and street scape features affect livability differently?

3. Which of the urban visual characteristics influence the perceived livability of the selected heritage area in Erbil city?

4. Are the perceptions of visual characteristics and livability significantly different across demographic groups and stakeholders?

3.4 Conceptual Framework:

Using the literature on heritage/ historical urban areas, urban livability, visual quality and urban aesthetics was reviewed, a conceptual framework was created to show the hypothesized links between important visual domains and livability outcomes **Figure (1)**. The framework differentiates between the visual building façade characteristics and streetscapes feature and services as concurrent factors influencing perceived livability, thereby informing the development of the research hypothesis and statistical analysis.

3.5 Research Hypothesis:

The living environment quality of the Qaysari Bazaar heritage area is theorized in terms of people's perceptions of urban visual characteristics. This is defined by two domains consisting of building façade characteristics and streetscapes features and services. These complementary yet distinct layers of visual characteristics contribute independently to people's lived experiences of place and are separately statistically meaningful within regression models estimating perceived livability.

4. Research methodology:

4.1 Research design:

A survey approach was employed to conduct the current study, as most of previous studies on livability and visual assessment have employed similar method to analyze specific urban area and residents' perceptions, as it has been widely used, present clear steps and uses standard tools. Architects and investors were selected using purposive sampling, as their professional expertise was essential for exploring the research study, the users were chosen and approached on-site. This method was specifically chosen to facilitate the selection of individuals with firsthand experience and interaction with the study area for direct, on-site data collection and observation. Visual characteristics variables were identified through a review of relevant literature **(see Table1)**. The impact of these characteristics on livability was assessed using a structured questionnaire with Likert-scale items. Participants' perceptions were analyzed using descriptive statistics, including mean scores, standard deviations, and regression analysis for real impact of each variable on livability. Differences across demographic and stakeholder groups were examined using ANOVA and t-tests.

4.2 Sampling strategy:

A convenience-based (onsite-online) non-probability purposive sampling was utilized to select participants and collect data from (319) respondents, which took three months; 300 were returned and valid, giving a 91% response rate. 130 onsite with users face to face while 189 by google form online which included architects, investors who are relevant to the study or experienced the area, representing a broad sample of Erbil residents. To determine an appropriate sample size, a priori power analysis conducted using G*Power 3.1.9.4 for Bivariate Correlation normal model, the calculation was based on the following parameters: a two-tailed test input an expected correlation of (ρ H1=0.2, under the alternative hypothesis, a significant level of α err prob α =0.05, desired power of (1-β err prob = 0.95) assuming the null hypothesis correlation (ρ H0) =0, the output: lower critical r=-0.1098359, upper critical r=0.1098359, actual power=0.9504516 formula underlaying the correlational sample size calculation is derived from the Fisher z- transformation for testing the significant of Pearson correlation coefficient:

$$n=((Z_{(1-\alpha/2)} +Z_{(1-\beta)}) ^2 / (\operatorname{arctanh}(\rho-1)-\operatorname{arctanh}(\rho-0)) ^2 +3.$$

where $Z_{(1-\alpha/2)}$ is the critical z- value for the chosen significant level. $Z_{(1-\beta)}$ is the critical z-value for the desired power, ρ-1 is the expected correlation under the alternative hypothesis, ρ-0 is the correlation under the null hypothesis, arctanh is the fisher z- transformation. The final sample size was sufficient for reliable analysis and included different stakeholder groups for representation. Qaysari Bazaar is specifically selected to be studied in detail because it has the highest impact from locals, tourism activities and mixed proportion of services, which contributes to the livability. In **table (1)** the questionnaire variables and items were developed based on previous studies on three different study fields (visual + livability, visual + heritage/historic, livability + heritage) and adapted to the context of Erbil. Content validity was ensured through several expert reviews by academic specialist in urban design and statisticians in architecture department, and 60 questionnaires were distributed and conducted for a pilot study, to test and improve the instrument, check answer. variability and reliability. The reliability test for final survey using Cronbach's Alpha to measure internal consistency, and the result indicated acceptable reliability by ($\alpha \geq 0.70$).

4.3 Tools for data collection:

Questionnaire surveys designed by researcher to evaluate residents' satisfaction and perceptions guided by a conceptual framework. It was crucial to obtain insights from the population that interacts directly with the architectural elements under investigation. In the first phase, to set out the theoretical and conceptual framework of the study, data extraction method was employed to review findings from previous studies and factors of livability. Based on this review, the conceptual model of the study was developed by identifying and extracting the variables of visual characteristics that may impact on livability in heritage area. In the second phase, a qualitative analysis of the case study was conducted through the questionnaire survey a participants evaluations. The third phase was a quantitative analysis to statistically test and validate the relationship between identified variables.

5. Criteria and strategies for case selection:

Erbil, the capital city of the Kurdish Region Iraq is located north of Iraq. According to UNESCO

(2010), Erbil is considered one of the oldest uninterruptedly dwelled in cities worldwide. **Figure (2)** illustrates study area and selected zones. According to (MANKURİ, 2022) Qaysari Bazaar is known for being a covered market. Bazaar has rich archaeological and historical backgrounds, one of the markets that remined unchanged. Located just south of Erbil's citadel, is one of the city's oldest markets. Built in the late 12th century and composed of historic structures, it was built by the Ottoman empire. This study adopts a single case study design focusing on Qaysari Bazaar. The selected case is chosen based on local heritage values as well as its proximity to the Citadel, a World Heritage, aligns with selected variables, research objectives and it is accessible for all users. The case images represented heritage areas with distinct visual characteristics, by consistently using brick, stone, uniform colors, and arched doorways, due to their visual harmony, architectural design and historic integrity, reinforcing their heritage character, with a few green benches, open landscape and proper street furniture installations that encourage comfort and social contact. The attractive atmosphere is further enhanced by cultural and historic landmarks, availability of services, proper upkeep and maintenance; these characteristics provide a visually cohesive, socially engaging and culturally rich heritage place, which makes them crucial for comprehending how people see livability and legacy value, as accessibility, active public use and the area's characteristics are relevant to collective variables that were chosen from previous studies to examine the relationship between visual quality and livability. Four heritage areas surrounding the bazaar are examined, based on accessibility, how diverse and intricate the site is; the Erbil Citadel, Machko café- two masjids, and parki shar as an adaptive reuse project, they act as a cultural and historical landmark that enhance the visual appeal and Impact on Qaysari Bazaar, zones 1-4. This gives the chance for a comprehensive data collection and analysis that is necessary to determine livability **Figure (2)**.

5. Criteria for photo selection:

The photo section focusing on visual characteristics of the heritage area in Qaysari Bazaar was performed across different streets around four different zones. The photos were taken at different times of the day when human activity was at its peak, to present livability and diversity of the site. Eight panoramic photos were captured around the bazaar to illustrate the site and to show the integrated context and scene of Erbil Zone 1-4. Photos were selected based on their locations on the map and their content relevant to the research study; the photos were then incorporated into the questionnaire. **Figure (3)** shows site photos linked to study zones.

6. Evaluation through questionnaire survey:

A questionnaire is designed to measure residents', architects' and investors' perceptions and their evaluations about seven urban visual characteristics. The final questionnaire comprised 55 simple questions taking 15-20 minutes to reply. Responses to each question were measured on a five-point linear numeric version of a Likert scale to give more options to respondents and to achieve precision consistent with reliability. The validity of the questionnaire was evaluated by face-to-face with users and online for the experts, as investors and architects primarily participated in the online evaluation. The following thematic categories describe the main parts of the questionnaire form:

1. *Cover letter:* Clarify the research aim, then, this part is including general information about the respondents as an introductory part of the questionnaire, this section contains questions about demography.

2. *Question section*: In this part participants were asked to determine the degree of impact of urban visual characteristics in heritage areas that impacted on quality of life in the area and their experience, which affected satisfaction and performance in the area.

7. Results overview:

The **Table (2)** provides the socio-demography of the respondents of the survey, essential for analyzing the impact of urban visual characteristics on the livability of Erbil's heritage region. The sample comprised 171 males (57.2%) and 128 females (42.8%). The age distribution indicates that most participants were aged between 21 and 40 years, with 114 respondents (38.1%) in the 21–30 category and 97 (32.4%) in the 31–40 category, collectively accounting for over two-thirds of the sample. reflecting a gender-balanced representation but with a small predominance of males. **Figure (2.1)** shows a comprehensive profile of the study sample. The focus on working-age adults and the active age may be important, for these groups are expected to be more involved

in urban life, alert of changes in the visual experience of heritage sites. Only 5% of the sample were under 21 years of age, and 2.7% of those surveyed were older than 60. Most participants had known the area for 6 to 35 years, with 124 individuals (41.5%) in the 6–20-year category and 116 (38.8%) in the 21–35-year group. Prolonged familiarity indicates that respondents have observed significant visual and structural transformations and are adequately equipped to discuss changes in livability and urban quality over time. The participants are predominantly general public users (74.4%), which provides a true end-user representation of the heritage area, architects also form a sizeable percentage (21.2%), while investors with (4.4%). The frequency of visits, another critical metric, is categorized as follows: uncommon or infrequent visits (29.0%), monthly visits (28.6%), weekly visits (23.6%), with a smaller proportion visiting daily (12.8%) or several times a week (6.1%). This combination allows data to reflect perceptions from both frequent, potentially resident users and those with sporadic engagement, such as commuters or visitors, hence expanding the range of observable effects. The respondents exhibit a high level of academic qualification, with around 43.1% possessing at least a Bachelor's degree and an additional 27.1% holding a diploma, master's, or PhD. The occupational distribution indicates that the majority are engaged in the private sector (30.5%) or are university students (11.1%), governmental sector (23.8%), the self-employed (23.5%), and the unemployed (11.1%), reflecting contributions from both public and private sectors. A diverse range of participant was chosen, to increase validity and guarantee that the result accurately represents the perspective of both locals and experts involved in Erbil's heritage area.

7.1. Revisiting Research Questions:

To determine how people perceive urban visual characteristic in heritage area, and how these perceptions relate to their sense of livability, the main axis of the questionnaire was analyzed. **Table (3)** presents "Visual characteristics of Urban Area" Overall, the mean score is 3.74, the standard deviation is 1.02, and the agreement percentage is 74.8%. These values suggest a generally high level of satisfaction, consensus among respondents, and their perception relate to sense of livability according to above agreed percentage.

Table (4) presents a statistical analysis of the main axis in the questionnaire, " Livability of Heritage Area". The mean score is 3.90 the standard deviation is 1.01, and the agreement percentage is 77.9 %, the results for each domain of the questionnaire on livability of Heritage Area indicate the most agreed-upon items, displaying respondents' priorities and perceptions clearly, and their perception strongly relate to livability.

For the positively or negatively to visual quality and livability of heritage area, **Table (4)** also shows "The characteristics of the heritage area contribute positively to visual quality and livability" in questionnaire survey (X9.9.1) led with 77.7% agreement, and this is most the important perception; people perceive visual characteristics very positively, and these perceptions directly enhance livability indicating awareness of a significant role in enhancing the aesthetic and sensory experience of the built environment, balancing positives against potential visual drawbacks, and building façade are free from any modern alteration (X9.9.2), led with 75.8% agreement, mean 3.79, and SD 1.07; this is also perceived as a positive factor in the heritage area.

Table (5) displays responses to two specific items regarding the most, positive visual characteristics that enhance visual quality and environment of the heritage areas. For item X9.9.3, the majority of participants (56.0%) emphasized the importance of Preserving integrity, harmonious of heritage building design and clean environment, in the heritage areas that enhance positive visual quality and livability, while 34.9% valued the availability of public greenery and only 9.1% preferred modern buildings within heritage area. In response to the most negative visual characteristics that detract from visual quality and environment of the heritage areas, item X9.9.4, a significant portion (64.9%) expressed concern about ignoring or loss of architectural integrity, harmonious and lack of cleanliness, with 23.7% noting lack of public greenery and just 11.4% mentioning the presence of modern buildings in heritage area. These results highlight that most respondents prioritize conservation, architectural design harmony, and cleanliness for maintaining the livability and visual quality of heritage areas and view neglecting areas and lack of greenery as critical negative factors that reduce visual quality, livability and heritage character. Positive

contributors outweighed negative ones, but the results show that livability in heritage areas depends heavily on managing visual consistency and environmental quality upkeep.

8.Correlation analysis

Table (6) reveals significant relationships between each variable of (Visual characteristics of Urban Area) and the Livability of Heritage area.

The correlation of Architectural integrity and cultural landmark presence (r=0.783) provision is particularly high, so that both stand out as essential dimensions in controlling livability degrees for such historic neighborhoods in Erbil. unity in Material (r=0.761), green spaces and environmental quality (r=0.744), street furniture (r=0.671), cleanliness and maintenance (r=0.623), architectural design and visual harmony (r=0.607), walkability (r=0.571), All identified relationships are significant at the 0.01 level

How perceptions of visual characteristics and livability vary across different demographic groups and stakeholders.

H3. Perceptions of livability varied across stakeholders' groups.

The result in **Table (10)** show that education level significantly influences how participants perceive both building façade and streetscape features heritage areas. The mean score for each education group reveals that higher academic qualifications correspond with more positive evaluations of urban visual quality, for example, the perception of building façades improves from 1.917 among illiterate participants to 4.262 among those with PhDs, and a similar upward trend appears for streetscape, features. The ANOVA results further confirm these differences as statistically significantly lower than 0.05, with F=12.414 for building façades and F= 6.633 for streetscape features. This indicates that variations in perception are due to random chance but are meaningfully linked to educational background. The findings suggest that higher educational attainment enhances awareness and appreciation of design quality, aesthetics, and livability within heritage urban environments.

Highly educated participants place greater value on building facade characteristics because they recognize these features as the core visual and cultural identity of heritage areas. SD values show the degree of agreement within each educational group. Lower SDs – such as 0.392 for PhD participants in BFC-indicate that opinions among highly educated respondents are more consistent and stable, reflecting a shared understanding of architectural heritage quality. Higher SDs among groups with lower education levels (e.g., 0.523 for illiteracy with low participants (N=6) and for secondary group with (N=13) SD= 0.870 suggest greater variability in perception, meaning that less-educated participants hold more diverse or uncertain opinions about visual quality. Similarly, the standard error SE values, which measure the reliability of the mean, decrease with higher education levels. This mean score of more educated groups is statistically more reliable and less affected by sampling variation; for instance, the SE for BFC among PhD participants = 0.148 is much smaller than that of the illiterate group= 0.213, confirming that the responses of higher-educated individuals are more consistent and dependable. As SE for SFS among PhDs is 0.229, while for illiteracy it is 0.396. This supports the hypothesis that education enhances understanding and appreciation of design aesthetics, heritage integrity and urban livability in heritage areas.

Duration of familiarity differences:

Table (11) shows results for duration of familiarity and it significantly affects perception of both BFC and streetscape features; participants familiar with the area for 6-20 years recorded the highest mean score for both building facade 4.027 and streetscape 3.735, indicating a more positive and long-time residents, strengthened attachment compared to those with less than 5 years or over 66 years with low participant of familiarity. However, the first group had enough time to understand, experience and appreciate the areas architectural and cultural qualities, while other group might become overly accustomed, critical or unhappy of its changes. In contrast, newcomers <5 years rated both variables much lower BFC = 2.940, SFS = 2.849 suggesting limited attachment or understating of the areas heritage value, interestingly, those familiar for very long periods (66+ years also showed lower rating due to lower participant (N=4), while BFC=3.056, SFS=3.307, possibility reflecting awareness of decline, may notice modernization, resulting in more critical perceptions. The ANOVA results confirm that these differences are statistically significant

F =9.887 for BFC with P=0.000, and F=5.179 for SFS with P=0.000 leaning familiarity duration influences perception rather than chance variation. Participants with moderate familiarity 6-35

expressed higher satisfaction with the visual quality and livability of the heritage area. This pattern suggests that individuals who have lived or interacted with the area long enough to recognize is spatial and cultural evolution, but not so long as to become desensitized to its changes, tend to appreciate its architectural and environmental qualities more positively and the middle group show positive and good rating. SD for mid- range familiarity groups for example 6-20, SD=0.557 for BFC, 0.673 for SFS show that their opinions are more consistent, while higher SDs among newcomers SD =0.923 for BFC, 0.918 for SFS, while the oldest familiarity group for 51 to over 66 years its SD for BFC=1.0170 - 0.965 indicate more diverse or uncertain views, or due to small sample size with N = 10 collectively which amplifying the individual variability, producing less consensus and more uncertain collective views. similarly, SE values are smaller around 0.05-0.06 for the large, mid-range groups, meaning their mean estimates are statistically more reliable. In contrast, groups with fewer participants (e.g., < 5 years or 66+ years) have higher SEs up from 0.223 up to 0.48 suggesting less precision in their average scores. Participants with moderate familiarity group (6-till 50) provide higher and more consistent rating, reflecting balanced awareness of heritage value and livability.

Participant category differences:

Table (12) reveals that architects rated both domains the highest BFC = 4.129, SFS =3.816 reflecting their professional awareness of design quality, heritage value, and aesthetic coherence. In contrast, users gave slightly lower mean scores than architects but moderate agreement by (BFC=3.770, SFS= 3.576) suggesting that while they recognize visual characteristics their priorities may differ to architects according to both BFC and SFS. Investors (BFC=3.778, SFS=3.774) showed consistent perceptions, likely balancing economic interests with BFC and streetscape feature and services. The ANOVA results confirm these differences as statistically significant – F=6.679, p=0.001 for BFC and F=3.085, P=0.047 for SFS – indicating that stakeholders meaningfully affect how heritage environments are visually perceived. The findings suggest that architects are the most visually sensitive group, users are guided by daily livability experiences, and investors maintain a pragmatic perspective shaped by commercial and functional considerations. SD and SE values show the consistency, reliability of responses and the precision of the mean within each participant group, architects have the lowest SD (e.g., SD=0.539 For BFC) and, SE =0.068 for both BFC and SFC) indicating high agreement and reliable mean scores. Users show slightly higher SDs (0.724 for BFC, and 0.733 for SFS) reflecting more diverse opinions, likely due to varied personal experiences and higher, however they have lowest standard errors (SE=0.049 for BFC) because of their large sample size (N=218), which makes their mean scores statistically more precise. Investors, with moderate to high SDs, demonstrate less consistency, perhaps due to their small sample size (N= 13) investors show highest SE Values =0.170 for BFC and SE= 0.225, for SFS and this makes the mean less reliable. The study reveals significant differences across demographic groups, demonstrating that perceptions of visual characteristics and livability are not uniform across society.

9. Hypothesis Results:

Table (7) suggests that there is a strong positive effect of urban visual characteristics on the livability of heritage areas in Erbil, as revealed by the regression analysis. The model explains 73.3% of the variability in livability (R^2 = 0.733) and exhibits strong predictive power. The positive (0.950) regression coefficient suggests that a one-unit increase in urban visual traits corresponds approximately to a one-unit increase in livability. Both the model (F = 816.670, p < 0.001) and individual predictor are strongly significant (t = 28.577, p < 0.001), implying that improving livability is much dependent upon urban visual characteristics enhancements. These results strongly aid with setting priorities of visual enhancement in the management of heritage areas. This finding confirms that livability in heritage environments is shaped not only by functional elements but also by urban visual characteristics.

H1. BFC and Livability:

BFC significantly influence the perceived livability of heritage area in Erbil city, as **Table (7)** demonstrates that the characteristics of building facades considerably and positively affect the perceived livability of heritage districts in Erbil city. The model accounts for 67.4% of the variance in livability (R^2 = 0.674), indicating a robust predictive correlation. The F-test score of

614.226 ($p < 0.001$) validates the statistical significance of the total model. The constant (intercept) coefficient is 0.644 ($t = 4.796$, $p < 0.001$), and the unstandardized coefficient for BFC is 0.852 ($t= 24.784$, $p < 0.001$). These results validate the hypothesis and confirm that the condition of building facades is a crucial factor in the livability of heritage areas.

H2. Streetscape features, services and livability:

Table (7) illustrates that the regression analysis indicates a significant and favorable impact of streetscape features and services on the perceived livability of heritage sites in Erbil. The model accounts for 58.3% of the variance in livability scores ($R^2 = 0.583$), with the F-test validating model significance ($F = 415.083$, $p < 0.001$). Each one-unit enhancement in streetscape features and services correlates with an average rise of 0.775 units in the livability score, a statistically significant finding ($t = 20.374$, $p < 0.001$). The intercept is significant (1.103, $t = 7.826$, $p < 0.001$). This hypothesis was accepted, affirming that enhancements to the streetscape and service supply are significant determinants of quality of life in heritage areas. As it important comes as a second after building faced characteristics.

Testing of the main hypothesis:

H1.1. Architectural design and visual harmony positively influence livability of heritage area.

Table (7) illustrates that architectural design and visual harmony greatly and positively affect the livability of heritage places in Erbil city. The model explains 37% of the variance in livability ($R^2 = 0.370$), and the F-test (174.342, $p < 0.001$) demonstrates substantial significance. The constant is 1.870 ($t = 11.785$, $p < 0.001$), and the regression coefficient for architectural design and visual harmony is 0.547 ($t = 13.204$, $p < 0.001$).

H1.2. Architectural integrity and cultural landmarks Impact on livability of heritage area.

Table (7) indicates that the regression analysis validates the hypothesis that architectural integrity and the existence of cultural monuments significantly and positively influence the livability of heritage districts in Erbil. The model accounts for 62.1% of the variance in livability ($R^2 = 0.621$), signifying a substantial impact. The F-test (485.723, $p < 0.001$) indicates the model's statistical significance. The coefficient for architectural integrity and cultural landmark presence is 0.750 ($t = 22.039$, $p < 0.001$). indicating that a one-unit enhancement in this variable results in a 0.75 increase in perceived livability. The constant is noteworthy (0.974, $t = 7.152$, $p < 0.001$). These results validate the hypothesis and demonstrate that augmenting architectural integrity and fostering cultural landmarks are successful ways for boosting the visual quality in heritage districts.

H1.3. The impact of material uniformity on the perception of livability. Enhancing visual appeal.

Table (7) reveals that the regression analysis confirms that material uniformity has a significant, positive effect on perceived livability in heritage locations. The model accounts for 59.3% of the variance in livability scores ($R^2 = 0.593$), signifying a robust correlation. The F-test result of 432.891 ($p < 0.001$) validates the model's significance. For every unit increase in material unity, the livability score rises by an average of 0.681 units, with the effect being highly significant ($t = 20.806$, $p < 0.001$). The intercept is statistically significant (1.288, $t = 9.965$, $p < 0.001$).

Streetscape features and services:

H2.1: The Impact of Maintenance Level & Cleanliness on livability of Heritage Area.

The data presented in **Table (7)** indicates that the levels of maintenance and cleanliness have a significant and positive effect on the perceived livability of heritage areas in Erbil. The model accounts for 34.2% of the variance in livability ($R^2 = 0.342$), and the F-test (154.126, $p < 0.001$) confirms a robust significance. A one-unit increase in maintenance and cleanliness correlates with a 0.526- unit increase in the livability score ($t = 12.415$, $p < 0.001$). Additionally, the constant is highly significant (2.013, $t = 12.795$, $p < 0.001$). These findings support the acceptance of this hypothesis and demonstrate that enhancing maintenance practices and cleanliness improves the quality of life for residents and visitors in heritage districts.

H2.2: Walkability Impact on livability of Heritage Area.

The results of the regression analysis in **Table (7)** show that walkability has a positive and significant impact on perceived livability in the heritage areas in Erbil. The model explains 34.4% of the variance for livability ($R^2 = 0.344$), and the F-test value (155.768, $p < 0.001$) shows the significance of all modal variables in the general model. The walkability coefficient (0.482, $t = 12.481$, $p < 0.001$) indicates that a one-unit increase in walkability corresponds to an increase

of 0.482 units in the livability score. The constant demonstrates high significance (2.225, t = 15.902, $p < 0.001$). The findings support the rejection of the null hypothesis, indicating that increased walkability in heritage areas enhances their perceived livability.

H2.3: Street furniture positively influences livability of the heritage Area, contributing to visual appeal and user comfort.

The results presented in **Table (6)** indicate that street furniture significantly and positively influences the perceived livability of heritage areas in Erbil. The regression model accounts for 49.9% of the variance ($R^2 = 0.499$), supported by a highly significant F-test (241.652, $p < 0.001$). The coefficient for street furniture is 0.578 ($t = 15.545$, $p < 0.001$). The intercept demonstrates statistical significance (1.831, $t = 13.275$, $p < 0.001$).

H2.4: Green spaces and environmental quality significantly enhance livability.

The regression analysis presented in **Table (7)** indicates that green spaces and environmental quality significantly and positively influence the livability of heritage areas in Erbil. The model accounts for 60% of the variance in the livability score ($R^2 = 0.60$), and the F-test demonstrates high significance ($F = 445.022$, $p < 0.001$), thereby affirming the model's strength and reliability. Each one-unit increase in green space and environmental quality corresponds to a 0.690 unit increase in the livability score ($t = 21.096$, $p < 0.001$). The intercept is also significant, with a value of 1.308 ($t = 10.327$, $p < 0.001$). The findings strongly support the hypothesis and demonstrate the value of investing in green infrastructure and maintaining environmental quality in heritage environments.

10. Multiple regression analysis and hypothesis testing:

Table (8) shows the results of the multiple regression with the approach in which both BFC and streetscape features and services have a significant positive effect on perception livability in heritage areas of Erbil city. The model accounts for 74% of the variance in livability scores ($R^2 = 0.740$), which indicates a good explanatory power. Both predictors show high significance, with BFC impacting strongly (0.584 per unit increase), while streetscape features and services follow (0.369 per unit increase). The Durbin-Watson statistic of 1.713 indicates the absence of autocorrelation in the residuals, while the VIF value of 2.019 suggests that multicollinearity is not a significant concern. The findings indicate that enhancements in façade aesthetics and urban amenities significantly improve the quality of life in heritage environments. and in **Table (9)** shows predicted livability values based on BFC and SFS. And **figure (10)** shows the graph of the impact of urban visual characteristics on livability based on regression analysis.

11. Discussion:

The study found that urban visual characteristics and heritage conservation positively impact the perceived livability and residents' perception, and study showcase that the BFC, specifically the building façade's architectural integrity and the presence of cultural landmarks, carry the strongest influence on livability within the current study context and framework. These findings support the previously conducted research that focus on the significance of visual coherence, quality and heritage preservation and their role in urban and built environment satisfaction (Mundher, 2022; Liu, 2022). Seemingly the architectural integrity can function as a structural factor for the multiple stakeholders' experiential quality in the heritage area in comparison to aesthetics alone. The strength of predictive power of the BFC variables could suggest that livability of heritage areas is substantially sourcing visual and material continuity, this is similar to the arguments which were previously proposed which highlight that the preservation of the of architectural character is significant for cultural identity and livability (Keleş, 2018; Vîlcea, 2023), well-integrated façade elements positively influence the visual quality, environmental aesthetic, and heritage value of the area and this contributes to urban image and enhances the perception and appreciation environments (Bahar, 2022; Mundher, 2022; Aldelphi, 2019). In accordance with the findings of the study conducted by (Mundher, 2022; Liu, 2022; Rabee Jameel Al-Shammari, 2024) preserving visually coherent historical buildings and landmarks strengthens cultural identity, create a sense of place, cultural pride and environmental satisfaction, while modern disruptions weaken reduce visual integrity and heritage authenticity, while (Muna Salameh, 2022; Alamoush, 2022) claimed that consistent traditional materials help climate adaptation, providing environmental comfort. (Sabah, 2015)

he concluded that visual pollution and neglect degrade architectural integrity, reduce visual appeal, diminish cultural value, whereas loss of integrity diminishes the area's continuity (SANTOSA, 2013), whereas (Haque, 2024) ensured renovation strategies retain unique character, functional and economically thriving spaces. Moreover, heritage conservation can enhance sustainability, strengthen cultural identity, support tourism and local development (Salameh, 2022).Aside from the strong influence of the BFC on livability in heritage areas, SFS also demonstrated a strong but secondary influence in this study. For example, the variables such as green spaces, maintenance, and walkability showed a highly positive effect on livability. (Sabah, 2015; Sepe, 2017) earlier mentioned the positive and critical importance of cleanliness and maintenance, as it is essential for overall happiness, satisfaction, enhancing accessibility and atmosphere in heritage environments, whereas (Seth, 2023) focus on the factors of neglect and visual order that both can significantly decrease the aesthetic perception, loss of historical character, and urban satisfaction, (Ali, 2025) also exhibited that poor maintenance and cleanliness lower livability and visual quality. Although statistically, both BFC and SFS play significant roles in determining the livability with BFC having a stronger influence. They are both reinforcing one another and this suggest that they contribute to livability by contributing to each other rather than replacing each other, and for Improving pedestrian Infrastructure and accessibility while reducing vehicular dominance strengthens social interaction, environmental quality making heritage spaces more livable (Shehab El-Deen, 2024), also (Fadhil, 2024) address that adaptive reuse and accessibility enhances mobility and community vitality it can also affect heritage building performance by comfort, engagement and user experience, this further support (Furlan, 2016) study that consider walkability as a part of " happy places''. Similarly, studies of (Jamil, 2022; Seth, 2023) highlighted that pedestrian-oriented design contributes to social activities, enhancing livability and improve social life. The findings support the hypothesis that improvements in street furniture, including Well- designed benches, lighting, landscaping and signage, directly enhance visual appeal, user comfort and social interaction. (Ali, 2025; Haque, 2024; Tucker, 2007; Aldelphi, 2019; Jamil, 2022). Whereas (Sepe, 2017) also addresses that street furniture's support social interaction in urban communities. In addition, (Keleş, 2018) asserted that it can act as a part of visual quality in traditional city centers, contributing to aesthetic appeal. Greenery and better environmental quality offer numerous benefits, from improving physical and mental health to fostering social cohesion and mitigating environmental issues (Kostas Mouratidis, 2022) (Tucker, 2007), Implementing green infrastructure that directly enhances urban vitality is one of the strategies that been highlighted by (Shehab El-Deen, 2024).

So, the findings of (Mundher, 2022) shows that greenery act as key elements in aesthetic urban development and cultural heritage conservation and it generates positive visual perception and satisfaction of urban dwellers. While (Sepe, 2017; Aldelphi, 2019) supported this perspective that high-quality natural environments are key in promoting urban happiness, enriching sensory experiences and improving livable places. Furthermore, (Aldelphi, 2019) highlighted that green element act as a part of visual sustainability. Therefore, the findings are consistent with previous research which indicates that well maintained preserved heritage areas, character, and their elements, such as coherent architectural design, historical integrity, adequate greenery, and well-maintained public areas, impact the quality of life, satisfaction, and sense of place; therefor, improving these significantly can enhance overall livability.

12. Conclusion:

Urban visual characteristics strongly impact livability by (R^2=0.733) and residents' perceptions are positive and strongly linked to livability. Visual Characteristics such as architectural integrity and cultural landmarked, unity in material, green spaces and environmental quality, street furniture, maintenance and cleanliness, architectural design and visual harmony, and walkable streets were consistently identified as the strongest contributor's impact.

The research also highlights that some visual characteristics affect positively or negatively on livability of the areas. First positive visual qualities which mostly enhance Livability, were surveyed in questionnaire. The result showed preserving integrity, the harmonious heritage building design and clean environment in the

heritage areas, followed by the availability of public greenery, and then modern buildings presence in heritage areas. On the contrary, negative qualities for livability, were the ignoring or loss of architectural integrity, harmony and lack of cleanliness in the heritage areas, then followed by lack of public greenery and presence of modern buildings in heritage areas.

Finally, differences in how various demographic groups and stakeholders perceive visual characteristics and livability are a clear result of the study. This suggests that education increases awareness of design quality, heritage value, and environmental aesthetic. And for duration of familiarity, participants familiar with the area for 6-20 years gave the highest rating, while newcomers and long-term residents rated lowest, reflecting either limited familiarity or critical awareness of changes in the area. While participant's category, for architects, showed high sensitivity to visual identity and heritage quality. General users focused more on daily functional comfort, while investors balanced aesthetics with economic considerations. ANOVA confirmed significant differences among all three groups. These findings confirm that visual and livability perceptions vary meaningfully across education, familiarity, and stakeholder roles, highlighting the need for inclusive planning and communication. It fills a critical gap in the literature by examining how urban visual characteristics affect residents' livability factors in Erbil's historic areas as mentioned previously.

The study recommends the following:

Architectural design and visual harmony enhance context-sensitive renovations. The study recommends maintaining visual order across facades to reinforce a cohesive streetscape. Architectural integrity and cultural landmark presence: preserve buildings of historic significance and conservation areas from inappropriate alterations in order to make them visible, integrated and provide a sense of character to the heritage area. Unity in materials: use the same or similar traditional materials on facades, paving and public elements, avoiding modern and not-fitting material replacements that destroy the character of areas. Promote walkability: establish safe linear and interconnected pedestrian paths that are free from obstructions and strategically located signage to facilitate wayfinding and stimulate foot travel. Improve Street Furnishings and Aesthetics: Provide and maintain benches where appropriate for aesthetics, use, and make functional, comfortable lights and signs that are visually compatible with the district's historic character to enhance streetscape attractiveness. Maintenance cleanliness and upkeep: Establish regular cleaning and maintenance schedules for streets, facades and public spaces to preserve a pleasant and inviting atmosphere. Increase green and shaded spaces: integrate trees, pocket parks and shady seating areas to enhance comfort, reduce heat, and improve environmental quality visually and functionally. So, after the result analysis, it's important to protect architectural integrity and cultural landmarks in the area, enforce material unity in buildings, increase greenery, improve environmental quality, and enhance street furniture and pedestrian amenities for better walkability. All that will encourage local participation create a sense of ownership and pride in the heritage area and support economic vitality and social activity.

The research contribution and recommendations:

The study provides a set of significant academic and practical contributions for planners, urban designers, architects, investors and decision makers. The design and planning of livable heritage areas is crucial for enhancing the quality of life for residents and visitors. Therefore, the board of governorship, municipality, and director of antiques and heritage in Erbil city should take into account the theoretical framework of this study, with visual characteristics that maintain its heritage identity and authenticity of the area. These include the creation of architectural cohesiveness, expansion of the green infrastructure, the inclusion of historical and culturally sensitive places and the enhancement of street-level aesthetics through sensitive street furniture and material choices. In doing so, these acts add real value to users' daily quality of life. while also strengthening cultural identity, which must be designed by professionals and experts in this field in line with UNESCO's World Heritage Sites guidelines and its expertise in the field. This ensures that conservation efforts are not only visually appealing but also inclusive and socially responsive. The study recommends attracting more attention to maintaining and conducting urban characteristics of heritage area in Erbil city.

Heritage or historic centers are essential in the city center to maintain these characteristics and to be aware of using any kind of modern form. These dimensions are often considered separately in research; however, this study emphasizes their interconnected impact on livability in heritage contexts. The study offers insights that are rarely addressed in global literature. The interplay between cultural conservation and urban modernizing is analyzed through characteristics like green spaces, use of traditional materials, preserving and improving visual integrity of heritage areas, and providing localized strategies for sustainable urban developments. Users and visitors should be informed, through government initiatives, about their responsibility to keep the heritage area clean and preserve its visual quality, avoiding anything that negatively distracts from the area's appearance. It is important to keep the Qaysari bazaar design in line with the citadel style and the surrounding area to keep its historical and cultural value, to enhance the quality of life in the area and to revive it inclusively to be used by different groups of users at all times. Finally, the study highlights visual characteristics as a key element that promotes sustainable urban heritage—the use of durable, contextually appropriate design elements that balance cultural conservation with functional modernization.

Limitations:

The study bears several limitations, firstly it is based on a singly case study and therefore generalizability of the findings are limited to only similar cases in terms of socio-cultural and regulatory backgrounds. Secondly, the data reporting could be influenced by temporal subjective factors of the participants. Thirdly, the stakeholder selection was cross-sectional, however it does not count for sessional variations of the area.

Future research

This study aimed to examine the impact of urban visual characteristics on livability in the heritage area of Erbil city. In this study, the future studies can be derived into:

1. Compare Erbil Citadel to Qaysari Bazaar or other Middle Eastern cultural sites. or comparison between two or more heritage areas.

2. Compare how visual qualities impact livability across cultures and regions.

3. Integrate quantitative surveys with qualitative methodologies (interviews, focus groups, participatory mapping).

4. Sustainability and Environment: compare visual quality to shade, ventilation, energy efficiency, and urban vegetation to Discover how sustainable visual design may improve livability without compromising history.

5. Future studies could explore nighttime livability in heritage areas, examining safety, lighting, accessibility, and social activity to analyze the attractiveness and usability of the area. Economic vitality in heritage areas also can be explored and studied with, in-depth accessibility, and public transportation in the selected areas.

6. Also, can focus on visual sustainability of heritage areas to achieve quality of life and how it impacts on the selected areas of in Erbil city.

7. Having GIS, VR/AR simulations, or AI-based visual analysis may objectively evaluate street topology, façade quality, and visual unity. Explore how immersive technology affects historic urban design public participation.

8. Governance/Policy Studies Assess how urban policies, UNESCO norms, and local government affect visual quality management. Examine how community involvement improves heritage and urban livability.

The importance of the study

This study informs decision-making where results of this study to prepare strategic historic and design planning for heritage areas to be more livable and based on locally gathered data. Providing a base to create and introduce variables of visual characteristics of urban and livability factors to be applied to the analysis of the existing heritage area and to be used for future visual and livability research.

Beneficiaries of the study

Ministry of Municipality and Tourism/KRG and its directories. Planners, urban designers, academics and architects. Investors.

Acknowledgements

We extend our appreciation and gratitude to the anonymous reviewers for their detailed and constructive feedback during the preparation of this paper.

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تأثير خصائص البصرية علي قابلية العيش في المنطقة التراثية في مدينة اربيل

المستخلص

تبحث هذه الدراسة في تأثير الخصائص البصرية الحضرية علي قابلية العيش في منطقة التراثية المحيطة بقيسريه أربيل. اعتمدت الدراسة منهجا مختلطا يجمع بين قائمة الملاحظة الميدانية وتحليل الصور، واستطلاع راي شمل ٣٠٠ مشارك، لتقييم سبعة عناصر البصرية أساسية تشمل: التصميم المعماري والانسجام البصري، سلامة الهوية المعمارية ووجود المعالم الثقافية، وحدة المواد، قابلية المشي، الأثاث الحضري، مستوي الصيانة والنظافة، والمساحات الخضراء وجودة البيئة. كما تمت دراسة علاقتها بتسعة عوامل للعيش الكريم مثل: الهوية، الارتباط بالمكان، الصحة والرفاهية، الشعور بالأمان، إمكانية الوصول، الحيوية الاقتصادية، والرضا البيئي. أظهرت النتائج ان الخصائص البصرية الحضرية تؤثر بشكل كبير على إدراك السكان والزوار لقابلية العيش، حيث كان لعناصر الواجهات المعمارية وخصائص المشهد الحضري التأثير الأكبر، واكدت نماذج الانحداران الجودة البصرية تفسر أكثر من ٧٠٪ من التباين في قابلية العيش، مما يبرز دور الانسجام المعماري، سلامة التراث، توفر المساحات الخضراء، وصيانة الفضاءات العامة. خلصت الدراسة الي ان تعزيز الانسجام البصري، والحفاض على الهوية التراثية، وتحسين بيئة المشاة بعد استراتيجيان أساسية لدعم مناطق تراثية قابلية للعيش ومزدهرة ثقافيا. وتوصي الدراسية المخططين والمهندسين والجهات المختصة بالتراث باعتماد مبادئ تصميم حساسة للسياق ومتناغمة مع المعايير لضمان تنمية مستدامة للنسيج الحضري التاريخي في أربيل. الكلمات المفتاحية: الخصائص البصرية الحضرية، المناطق التراثية، سوق القيصري، سلامة الطراز المعماري، جودة المشهد الحضري، مدينة أربيل، صيانة التراث الثقافي.

الكلمات المفتاحية:

الخصائص البصرية الحضرية، جودة الحياة، المناطق التراثية، سوق القيصري، مدينة أربيل.

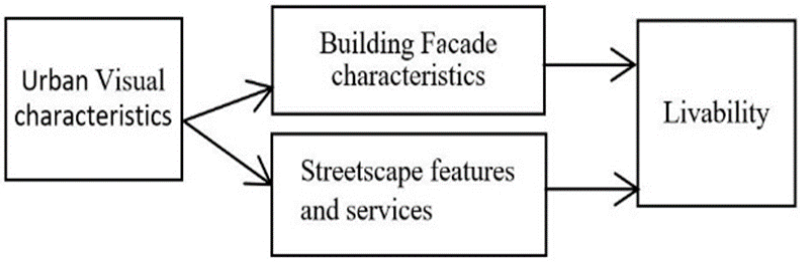

Figure (1)

Figure (2) Study area and selected zones

Figure (3) site photos Linked to study zones

Table (1) The Variables of visual characteristics in urban environment and heritage area according to various categories and their references

Study categories	
Studies focus on Visual + livability	**Historic, architectural Design Visual Harmony:** (Mundher, 2022), (SANTOSA, 2013), (Keleş, 2018), (Tucker, 2007), (Bahar, 2022), (Utaberta, 2012), (Vîlcea, 2023), (Farhan, 2020), (Nia., 2021), (Alamoush, 2022), (Shehab El-Deen, 2024), (Seth, 2023), (Meysam Deghati Najd a, 2015), (Aldelphi, 2019). **Architectural integrity and Cultural landmark presence:** (SANTOSA, 2013), (Keleş, 2018), (Liu, 2022), (Rabee Jameel Al-Shammari, 2024), (Vîlcea, 2023), (Farhan, 2020), (Shehab El-Deen, 2024), (Meysam Deghati Najd a, 2015), (Aldelphi, 2019), (Mundher, 2022). **Aesthetic appeal:** (Tucker, 2007), (Ali, 2025), (Bahar, 2022), (Nia., 2021), (Sepe, 2017), (Furlan, 2016), (Shehab El-Deen, 2024), (Alamoush, 2022). **Unity in material:** (Mundher, 2022), (SANTOSA, 2013), (Keleş, 2018).
Studies on (visual and heritage or historic)	**Maintenance level and Cleanliness :** (Mundher, 2022), (Keleş, 2018), (Sepe, 2017), (Ali, 2025), (Jamil, 2022), (Seth, 2023), (Shehab El-Deen, 2024), (Farhan, 2020), (S. Treija, 2020), (Meysam Deghati Najd a, 2015), (Aldelphi, 2019), (Nia., 2021), (Sabah, 2015), (Haque, 2024), (Alamoush, 2022), (Utaberta, 2012), (Rabee Jameel Al-Shammari, 2024), (Vîlcea, 2023). **Walkability:** (Sepe, 2017), (Ali, 2025), (Jamil, 2022) , (Meysam Deghati Najd a, 2015), , (Shehab El-Deen, 2024), (Furlan, 2016), (Haque, 2024). (Kostas Mouratidis, 2022), (Seth, 2023), (Alamoush, 2022), (Nia., 2021). **Green spaces & environmental Quality:** (Shehab El-Deen, 2024), (Haque, 2024), (Seth, 2023), (Alamoush, 2022), (Nia., 2021), (Keleş, 2018), (Mundher, 2022), (Sepe, 2017), (Meysam Deghati Najd a, 2015), (Aldelphi, 2019), (Ali, 2025), (Kostas Mouratidis, 2022), (Liu, 2022), (Tucker, 2007), (Furlan, 2016) **,** (Jamil, 2022)**.** **Street furniture:** (Ali, 2025), (Sepe, 2017), (Kostas Mouratidis, 2022), (Haque, 2024), (Shehab El-Deen, 2024), (SANTOSA, 2013), (Alamoush, 2022), (Jamil, 2022), (Tucker, 2007), (Keleş, 2018).
Studies focus on (Livability and heritage)	**Color and Texture:** (Vîlcea, 2023), (Mundher, 2022), (Nia., 2021), (Sepe, 2017), (Tucker, 2007), (Utaberta, 2012), (Bahar, 2022), (Keleş, 2018), (Meysam Deghati Najd a, 2015), (Farhan, 2020), (Aldelphi, 2019), (Rabee Jameel Al-Shammari, 2024), (S. Treija, 2020), (Sabah, 2015). **Building condition:** (S. Treija, 2020), (Farhan, 2020), (Rabee Jameel Al-Shammari, 2024), (Alamoush, 2022), (Haque, 2024), (Shehab El-Deen, 2024), (Bahar, 2022), (Aldelphi, 2019).
Factors of Livability	**sense of place/ Identity:** (Mundher, 2022), (Farhan, 2020), (Rabee Jameel Al-Shammari, 2024), (S. Treija, 2020), (Vîlcea, 2023), (Sabah, 2015), (Shehab El-Deen, 2024).

place attachment: (Tucker, 2007), (Kostas Mouratidis, 2022), (Sepe, 2017), (Furlan, 2016), (Seth, 2023), (Jamil, 2022), (Alamoush, 2022).

Health & wellbeing: (Tucker, 2007), (Kostas Mouratidis, 2022), (Sepe, 2017), (Furlan, 2016), (Ali, 2025), (Haque, 2024), (Nia., 2021).

Safety perception & comfort: (Ali, 2025), (Furlan, 2016), (Sepe, 2017), (Haque, 2024), (Shehab El-Deen, 2024), (Kostas Mouratidis, 2022).

Perception of happiness and Environmental satisfaction: (Keleş, 2018), (Ahmed, 2019), (Sepe, 2017), (Shehab El-Deen, 2024), (Haque, 2024), (Ali, 2025), (Liu, 2022), (Kostas Mouratidis, 2022), (Tucker, 2007), (Nia., 2021), (Seth, 2023), (Jamil, 2022), (Alamoush, 2022).

Economic Vitality: (Farhan, 2020), (S. Treija, 2020), (Seth, 2023), (Shehab El-Deen, 2024), (Nia., 2021), (Ali, 2025), (Haque, 2024), (Jamil, 2022), (Rabee Jameel Al-Shammari, 2024), (Alamoush, 2022), (Furlan, 2016).

Community engagement and Availability of services: (Ali, 2025), (Tucker, 2007), (Sepe, 2017), (Haque, 2024), (Alamoush, 2022), (Furlan, 2016), (Jamil, 2022), (Sabah, 2015), (Shehab El-Deen, 2024), (Rabee Jameel Al-Shammari, 2024), (Ahmed, 2019), (Nia., 2021), (Tucker, 2007), (S. Treija, 2020).

Accessibility: (Ali, 2025), (Haque, 2024), (Sepe, 2017), (Furlan, 2016), (Shehab El-Deen, 2024), (Kostas Mouratidis, 2022), (Tucker, 2007), (Alamoush, 2022), (Nia., 2021), (Seth, 2023), (Jamil, 2022).

Positive & negative visual quality: (Mundher, 2022), (Bahar, 2022), (Nia., 2021), (Sabah, 2015), (Tucker, 2007), (SANTOSA, 2013), (Vîlcea, 2023), (Shehab El-Deen, 2024), (Farhan, 2020), (S. Treija, 2020).

Table (2) Socio Demographic results of the respondents for the studied case study

Critical matric	categories	n	%
Gender	Male	171	57.2%
	Female	128	42.8%
Age	<= 20	15	5.0%
	21 - 30	114	38.1%
	31 - 40	97	32.4%
	41 - 50	51	17.1%
	51 - 60	14	4.7%
	61 - 70	6	2.0%
	71+	2	0.7%
Duration of familiarity	<= 5	17	5.7%
	6 - 20	124	41.5%
	21 - 35	116	38.8%
	36 - 50	32	10.7%
	51 - 65	6	2.0%
	66+	4	1.3%
Frequency of visit	Several times a week	18	6.1%
	Rarely A few times a year	86	29.0%
	Weekly	70	23.6%
	Daily	38	12.8%
	Monthly	85	28.6%
Participant category	Architect	62	21.2%
	User	218	74.4%
	Investor	13	4.4%
Academic Qualification	Illiteracy	6	2.0%
	Elementary	2	0.7%
	Secondary	13	4.3%
	High school	28	9.4%
	Bachelor student	40	13.4%
	Diploma	43	14.4%
	Bachelor (B.Sc.)	129	43.1%
	Master degree (MSc.)	31	10.4%
	PhD	7	2.3%
Working sector	University students	33	11.1%
	Governmental sector	71	23.8%
	Private sector	91	30.5%
	Self-employed	70	23.5%
	Non- Employed	33	11.1%

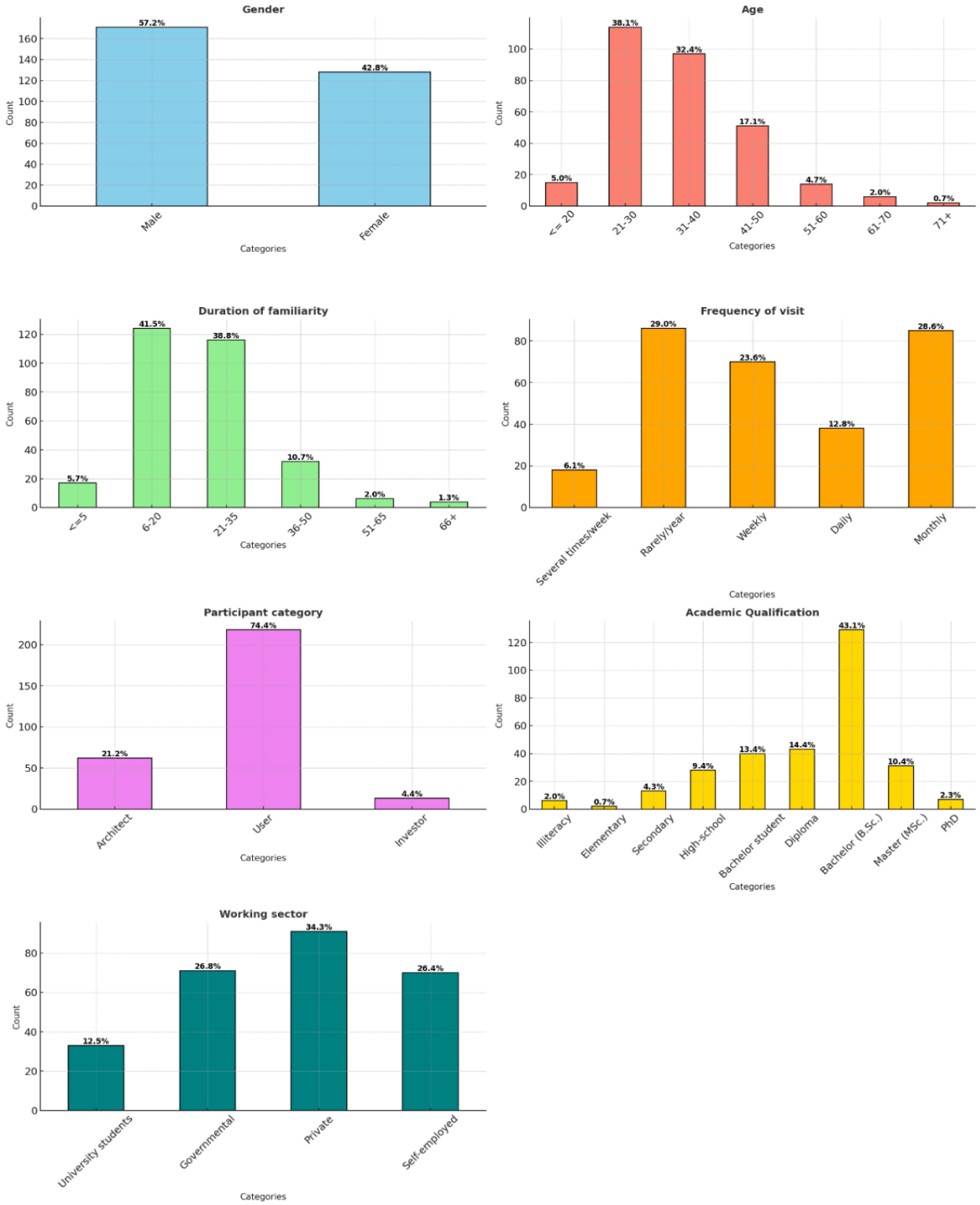

Figure (2.1) comprehensive profile of the study sample

Table (3) Statistical Summary of Visual Characteristics Domains in Urban Area Questionnaire

Domain	Symbol	Strongly		Disagree		Neutral		Agree		Strongly		Mean	SD	% Agreement
		n	%	n	%	n	%	n	%	n	%			
Architectural Design & Visual Harmony	X1.1	7	2.3%	40	13.4%	80	26.8%	125	41.8%	47	15.7%	3.55	0.99	71.0%
	X1.2	11	3.7%	27	9.0%	61	20.4%	120	40.1%	80	26.8%	3.77	1.06	75.5%
	X1.3	6	2.0%	18	6.0%	58	19.4%	107	35.8%	110	36.8%	3.99	0.99	79.9%
	X1.4	13	4.3%	30	10.0%	75	25.1%	109	36.5%	72	24.1%	3.66	1.08	73.2%
Architectural Integrity & cultural landmark presence	X2.1	6	2.0%	26	8.7%	53	17.7%	108	36.1%	106	35.5%	3.94	1.03	78.9%
	X2.2	13	4.3%	29	9.7%	62	20.7%	120	40.1%	75	25.1%	3.72	1.08	74.4%
	X2.3	5	1.7%	17	5.7%	48	16.1%	115	38.5%	114	38.1%	4.06	0.96	81.1%
	X2.4	7	2.3%	13	4.3%	36	12.0%	113	37.8%	130	43.5%	4.16	0.96	83.1%
	X2.5	11	3.7%	31	10.4%	64	21.4%	125	41.8%	68	22.7%	3.70	1.05	73.9%
	X2.6	7	2.3%	17	5.7%	50	16.7%	120	40.1%	105	35.1%	4.00	0.98	80.0%
Maintenance level & cleanliness	X3.1	6	2.0%	35	11.7%	86	28.8%	104	34.8%	68	22.7%	3.65	1.02	72.9%
	X3.2	7	2.3%	37	12.4%	107	35.8%	98	32.8%	50	16.7%	3.49	0.99	69.8%
	X3.3	12	4.0%	28	9.4%	72	24.1%	102	34.1%	85	28.4%	3.74	1.09	74.7%
Unity in material	X4.1	4	1.3%	15	5.0%	67	22.4%	123	41.1%	90	30.1%	3.94	0.92	78.7%
	X4.2	5	1.7%	18	6.0%	57	19.1%	138	46.2%	81	27.1%	3.91	0.92	78.2%
	X4.3	7	2.3%	34	11.4%	63	21.1%	120	40.1%	75	25.1%	3.74	1.03	74.8%
Walkability	X5.1	13	4.3%	56	18.7%	81	27.1%	92	30.8%	57	19.1%	3.41	1.12	68.3%
	X5.2	13	4.3%	35	11.7%	92	30.8%	109	36.5%	50	16.7%	3.49	1.04	69.9%
	X5.3	6	2.0%	28	9.4%	71	23.7%	127	42.5%	67	22.4%	3.74	0.98	74.8%
	X5.4	19	6.4%	40	13.4%	94	31.4%	93	31.1%	53	17.7%	3.40	1.12	68.1%
Street furniture	X6.1	7	2.3%	27	9.0%	62	20.7%	122	40.8%	81	27.1%	3.81	1.01	76.3%
	X6.2	9	3.0%	47	15.7%	70	23.4%	108	36.1%	65	21.7%	3.58	1.09	71.6%
	X6.3	13	4.3%	38	12.7%	95	31.8%	109	36.5%	44	14.7%	3.44	1.03	68.9%
Green spaces & Environmental quality	X7.1	8	2.7%	19	6.4%	68	22.7%	109	36.5%	95	31.8%	3.88	1.01	77.7%
	X7.2	5	1.7%	32	10.7%	83	27.8%	117	39.1%	62	20.7%	3.67	0.98	73.3%
	X7.3	6	2.0%	24	8.0%	71	23.7%	116	38.8%	82	27.4%	3.82	0.99	76.3%
Total												3.74	1.02	74.8%

Table (4) Statistical Summary of livability of Heritage Area

Domain	Symbol	Strongly		Disagree		Neutral		Agree		Strongly		Mean	SD	% Agreement
		n	%	n	%	n	%	n	%	n	%			
Sense of place/ Identity	X9.1.1	7	2.3%	17	5.7%	58	19.4%	129	43.1%	88	29.4%	3.92	0.96	78.3%
	X9.1.2	11	3.7%	17	5.7%	57	19.1%	122	40.8%	92	30.8%	3.89	1.02	77.9%
	X9.1.3	6	2.0%	15	5.0%	39	13.0%	118	39.5%	121	40.5%	4.11	0.95	82.3%
Economic Vitality	X9.2.1	7	2.3%	14	4.7%	53	17.7%	108	36.1%	117	39.1%	4.05	0.98	81.0%
	X9.2.2	9	3.0%	16	5.4%	36	12.0%	128	42.8%	110	36.8%	4.05	0.99	81.0%
	X9.2.3	4	1.3%	26	8.7%	51	17.1%	118	39.5%	100	33.4%	3.95	0.99	79.0%
Accessibility	X9.3.1	12	4.0%	17	5.7%	70	23.4%	113	37.8%	87	29.1%	3.82	1.04	76.5%
	X9.3.2	10	3.3%	29	9.7%	58	19.4%	130	43.5%	72	24.1%	3.75	1.03	75.1%
	X9.3.3	5	1.7%	32	10.7%	56	18.7%	140	46.8%	66	22.1%	3.77	0.97	75.4%
	X9.3.4	8	2.7%	14	4.7%	60	20.1%	105	35.1%	112	37.5%	4.00	1.00	80.0%
Perception of happiness & environmental	X9.4.1	12	4.0%	9	3.0%	73	24.4%	111	37.1%	94	31.4%	3.89	1.02	77.8%
	X9.4.2	7	2.3%	30	10.0%	78	26.1%	108	36.1%	76	25.4%	3.72	1.03	74.4%
	X9.4.3	4	1.3%	26	8.7%	57	19.1%	114	38.1%	98	32.8%	3.92	0.99	78.5%
Safety perception & comfort	X9.5.1	10	3.3%	17	5.7%	54	18.1%	110	36.8%	108	36.1%	3.97	1.04	79.3%
	X9.5.2	8	2.7%	24	8.0%	48	16.1%	128	42.8%	91	30.4%	3.90	1.01	78.1%
	X9.5.3	14	4.7%	31	10.4%	75	25.1%	117	39.1%	62	20.7%	3.61	1.07	72.2%
Place attachment	X9.6.1	12	4.0%	20	6.7%	46	15.4%	111	37.1%	110	36.8%	3.96	1.07	79.2%
	X9.6.2	8	2.7%	30	10.0%	49	16.4%	128	42.8%	84	28.1%	3.84	1.03	76.7%
	X9.6.3	8	2.7%	19	6.4%	52	17.4%	118	39.5%	102	34.1%	3.96	1.01	79.2%
	X9.6.4	7	2.3%	16	5.4%	48	16.1%	134	44.8%	94	31.4%	3.98	0.95	79.5%
Community engagement & Availability of services	X9.7.1	7	2.3%	24	8.0%	57	19.1%	129	43.1%	82	27.4%	3.85	0.99	77.1%
	X9.7.2	9	3.0%	11	3.7%	44	14.7%	143	47.8%	92	30.8%	4.00	0.94	79.9%
	X9.7.3	7	2.3%	14	4.7%	49	16.4%	113	37.8%	116	38.8%	4.06	0.97	81.2%
	X9.7.4	5	1.7%	24	8.0%	55	18.4%	128	42.8%	87	29.1%	3.90	0.97	77.9%
Health & wellbeing	X9.8.1	8	2.7%	23	7.7%	62	20.7%	126	42.1%	80	26.8%	3.83	1.00	76.5%
	X9.8.2	10	3.3%	34	11.4%	73	24.4%	108	36.1%	74	24.7%	3.68	1.07	73.5%
	X9.8.3	3	1.0%	29	9.7%	50	16.7%	123	41.1%	94	31.4%	3.92	0.98	78.5%
	X9.8.4	10	3.3%	16	5.4%	55	18.4%	121	40.5%	97	32.4%	3.93	1.01	78.7%
Positive & negative visual	X9.9.1	13	4.3%	18	6.0%	50	16.7%	127	42.5%	91	30.4%	3.89	1.05	77.7%
	X9.9.2	13	4.3%	23	7.7%	61	20.4%	119	39.8%	83	27.8%	3.79	1.07	75.8%
Total												3.90	1.01	77.9%

Table (5) visual and environmental qualities of heritage areas

Code	Category	n	%
X9.9.3	A. Preserving integrity, harmonious of heritage building design and clean environment.	167	56.0%
	B. Availability of Public greenery	104	34.9%
	C. Modern buildings in heritage area	27	9.1%
X9.9.4	D. Ignoring or loss of architectural integrity, harmonious and lack of cleanliness	194	64.9%
	A. Lack of public greenery	71	23.7%
	B. Modern buildings in heritage area	34	11.4%

Table (6) Correlation between each variable of (Visual characteristics of Urban Area) and the Livability of Heritage area

Variable	Pearson Correlation	p-value
Architectural Design & Visual Harmony	0.607**	<.001
Architectural Integrity & Cultural Landmark Presence	0.783**	<.001
Maintenance Level & Cleanliness	0.623**	<.001
Unity in Material	0.761**	<.001
Walkability	0.571**	<.001
Street Furniture	0.671**	<.001
Green Spaces & Environmental Quality	0.744**	<.001

** Significant at level ($p<0.01$)

Table (7) summary of Hypothesis Testing and Regression Models

Hypothesis	Independent variable	Dependent Variable	R^2	F-test (p-value)	t-test (p-value)	p-value	Regression model Equation with β
Main hypothesis	Urban visual characteristics	Livability of heritage area	0.733	816.670	Constant= 2.898 IV= 28.577	P<0.001	LHA= 0.366+0.950 UVC
H1	Building façade characteristics	Livability of heritage area	0.674	614.226	Constant= 4.796 IV= 24.784	P<0.001	LHA= 0.644+0.852 BFC
H1.1	Architectural design & visual harmony	Livability of heritage area	0.370	174.342	Constant= 11.785 IV=13.204	P<0.001	LHA= 1.870+0.547 ADVH
H1.2	Architectural integrity & cultural Landmark	Livability of heritage area	0.621	485.723	Constant= 7.152 IV=22.039	P<0.001	LHA= 0.974+0.750 AICL
H1.3	Material uniformity	Livability of heritage area	0.593	432.891	Constant= 9.965 IV=20.806	P<0.001	LHA= 1.288+0.681 MU
H2	Streetscape features & services	Livability of heritage area	0.583	415.083	Constant= 7.826 IV=20.374	P<0.001	LHA= 1.103+0.775 SFS
H2.1	Maintenance & cleanliness	Livability of heritage area	0.342	154.126	Constant= 12.795 IV=12.415	P<0.001	LHA= 2.013+0.526 MC
H2.2	Walkability	Livability of heritage area	0.344	155.768	Constant= 15.902 IV=12.481	P<0.001	LHA= 2.225+0.482 W
H2.3	Street Furniture	Livability of heritage area	0.499	241.652	Constant= 13.275 IV=15.545	P<0.001	LHA= 1.831+0.578 SF
H2.4	Green spaces & environmental quality	Livability of heritage area	0.600	445.022	Constant= 10.327 IV=21.096	P<0.001	LHA= 1.308+0.690 GEQ

Table (8) The Impact of Building facade characteristics & Streetscape features and services on livability of Heritage Area

Dependent Variable / **Independent Variable**	**Livability of Heritage Area**				
	R^2	**F-test (p-value)**	**β**	**t-test (p-value)**	**VIF**
Constant	74.0%	420.407 (p=0.000**)	0.333	2.652 (p=0.008**)	
Building facade characteristics			0.584	13.347 (p=0.000**)	2.019
Streetscape features and services			0.369	8.633 (p=0.000**)	2.019

** Significant at level (p<0.01), D. W=1.713

Multiple Regression Model Equation:

Livability of Heritage Area=0.333+0.584×(Building facade characteristics)+0.369×(Streetscape features and ser vices)

Table (9) predicted livability Values Based on BFC and SFS Scores

X1 (Impact of building façade Charactristics)	Y (X2=3)	X2(Impact of streetscape features & services)	Y (X1=3)
1	2.988	1	3.608
2	3.572	2	3.977
3	4.156	3	4.346
4	4.74	4	4.715
5	5.324	5	5.084

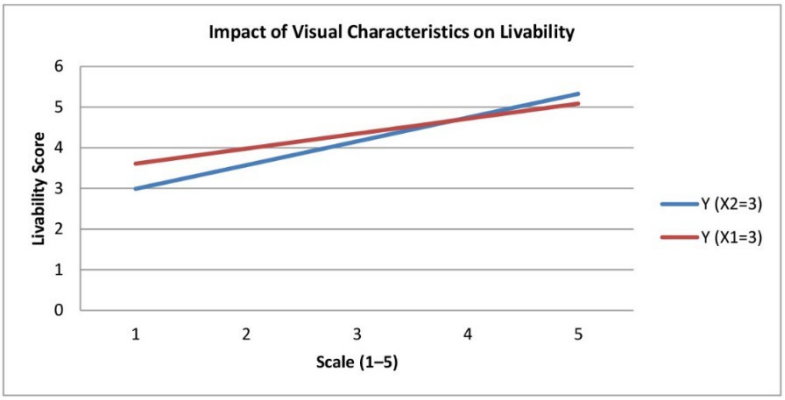

Figure (10) Impact of visual characteristics on livability based on Regression Analysis

Table (10) Effect of Academic Qualification on (B.F.C and S.F.S)

		N	Mean	Std. Deviation	Std. Error
Building facade characteristics	Illiteracy	6	1.917	0.523	0.213
	Elementary	2	1.944	0.118	0.083
	Secondary	13	3.853	0.870	0.241
	High school	28	3.802	0.662	0.125
	Bachelor student	40	4.224	0.489	0.077
	Diploma	43	3.796	0.574	0.088
	Bachelor (B.Sc.)	129	3.837	0.617	0.054
	Master degree (MSc.)	31	3.899	0.639	0.115
	PhD	7	4.262	0.392	0.148
	Total	299	3.845	0.695	0.040
streetscape features and services	Illiteracy	6	2.069	0.969	0.396
	Elementary	2	2.281	0.398	0.281
	Secondary	13	3.577	0.740	0.205
	High school	28	3.792	0.653	0.123
	Bachelor student	40	3.859	0.626	0.099
	Diploma	43	3.759	0.601	0.092
	Bachelor (B.Sc.)	129	3.608	0.675	0.059
	Master degree (MSc.)	31	3.483	0.668	0.120
	PhD	7	3.952	0.605	0.229
	Total	299	3.634	0.711	0.041

ANOVA

		Sum of Squares	df	Mean Square	F	p-value
Building facade characteristics	Between Groups	36،763	8	4،595	12،414	0.000
	Within Groups	107،354	290	0.370		
	Total	144،117	298			
streetscape features and services	Between Groups	23،283	8	2،910	6،633	0.000
	Within Groups	127،242	290	0.439		
	Total	150،525	298			

Table (11) Impact of duration of familiarity on (B.F.C and S.F.S)

		N	Mean	Std. Deviation	Std. Error
Building facade characteristics	<= 5	17	2.940	0.923	0.224
	6 - 20	124	4.027	0.557	0.050
	21 - 35	116	3.803	0.675	0.063
	36 - 50	32	3.885	0.597	0.106
	51 - 65	6	3.787	1.017	0.415
	66+	4	3.056	0.965	0.482
	Total	299	3.845	0.695	0.040
streetscape features and services	<= 5	17	2.849	0.918	0.223
	6 - 20	124	3.735	0.673	0.060
	21 - 35	116	3.654	0.659	0.061
	36 - 50	32	3.646	0.644	0.114
	51 - 65	6	3.573	0.836	0.341
	66+	4	3.307	0.974	0.487
	Total	299	3.634	0.711	0.041
ANOVA					
		Sum of Squares	df	Mean Square	F	p-value
Building facade characteristics	Between Groups	20.806	5	4.161	9.887	0.000
	Within Groups	123.311	293	0.421		
	Total	144.117	298			
streetscape features and services	Between Groups	12.222	5	2.444	5.179	0.000
	Within Groups	138.303	293	0.472		
	Total	150.525	298			

Table (12) Impact of Participant category on (B.F.C, and, S.F.S)

		N	Mean	Std. Deviation	Std. Error
Building facade characteristics	Architect	62	4.129	0.539	0.068
	User	218	3.770	0.724	0.049
	Investor	13	3.778	0.612	0.170
	Total	293	3.846	0.698	0.041
streetscape features and services	Architect	62	3.816	0.532	0.068
	User	218	3.576	0.733	0.050
	Investor	13	3.774	0.812	0.225
	Total	293	3.636	0.704	0.041
ANOVA					
		Sum of Squares	df	Mean Square	F	Sig.
Building facade characteristics	Between Groups	6.266	2	3.133	6.679	0.001
	Within Groups	136.046	290	0.469		
	Total	142.312	292			
streetscape features and services	Between Groups	3.019	2	1.509	3.085	0.047
	Within Groups	141.871	290	0.489		
	Total	144.890	292			