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INVESTIGATING THE URBAN MORPHOLOGY OF SH. ISA STREET DESIGN: A QUALITATIVE STUDY TO DEMONSTRATE STREETSCAPE AND HERITAGE PERCEPTION

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Abstract. This paper investigates the role of streetscape in enhancing users' sense of urban heritage in cities. Moreover, it is a leading player in improving tourism and trade, which drives the city's economy. Muharraq is located in northern-east Bahrain. The heritage areas of Muharraq have been well known for their culture, heritage and trade since globalization. Muharraq's urban morphology dramatically changed, distorting its historical core despite early modern planning's meticulous consideration of social coherence and historical significance. Unfortunately, in most projects of heritage areas of Muharraq, streets lack appropriate designs that accurately highlight the sense of heritage and the vital commercial activities and users' needs in heritage zones. Therefore, a comprehensive streetscape design concept that reflects the local heritage of Muharraq is needed more. Sheikh Isa Street is one of the main streets inside the heritage areas of Muharraq and was selected as a pilot study to examine the hypnosis that the appropriate streetscape will positively impact and enhance the visual seen and consequently improve the users' sense in heritage areas of Muharraq. This study aims to comprehend the essential urban design, streetscape elements and heritage preservation that are primary to achieve a sense of heritage that simultaneously respects the heritage of the street and emphasizes the importance of improving the heritage ambiance and that meets BACA and local municipality goals. In order to achieve the objective of the study, a mixed methodology was adopted to comprehend the research problem better. The qualitative method includes in-depth interviews, observations and site visits and the quantitative method includes using the QGS software. The findings show that the street needs better urban imageability, which has negatively impacted the sense of heritage, which is lost.

1. Introduction

1.1. Background information

More than ever, the world's cities are experiencing rapid growth, which impacts social and economic conditions. Unique impacts occurred, especially in cities with heritage areas most affected by globalization. Generally, these changes have resulted in

a lack of heritage preservation in third-world cities; the deteriorating streetscape conditions in such places are a strong reason for the lack of Users' Sense of Heritage Areas (Yunus *et al*., 2015). Streetscapes constitute a component of public space, which is public space for human use. Unfortunately, automobile traffic frequently dominates these spaces (Johansson, 2024). Urban design is the broad field of planning and designing cities, towns and other metropolitan areas. In some cases, due to improper urban design in some cities, streets are still commonly used for transportation. Still, they should focus on them as places for activities. Nature-based solutions and preserving their heritage can create more engaging spaces for a wider audience than just prepared-for-cars (Yunus *et al*., 2015). In the heritage part of the cities, street shoppers, pedestrians and vehicular traffic may have served as a stimulus for city dynamics. This driving force creates continual activity within the street's outdoor space.

Designing the streetscape under the umbrella of urban design is a crucial concept referred to as the "7 Cs of urban design". These are context, character, choice, connections, creativity, custodianship and cooperation (Urban Design Lab, 2023). It is the theory of renowned urban designer Allan Jacobs that the requirements for great streets are places for people to walk with some leisure, physical comfort, definition and meandering forms, qualities that engage the eyes, transparency, complementarity, maintenance and quality of construction and design (Jacobs, 1993).

A research study by Laura Frank compares these requirements with Norberg-Shulz's concept of the built environment influencing one's ability to experience a sense of place (Eldardiry, 2021). He contends that a location's identity and significance are influenced by its historical, cultural, or geographic background. Aside from the sense of place, Frank's research (2010) showed that other concepts of place are place attachment and a sense of community. Her study found that the best principle for urban streetscape design was Jacob's. In order to improve the visual richness and façade beauty of their properties, many cities work together as they understand the worth of their properties' heritage. They are entirely conscious of their heritage property's economic, social and environmental worth, which is particularly attractive to tourists (Britt, 2009). According to Laing (2011), cultural and heritage tourism marketing relies heavily on these factors. This new sense of space of the cities' collaboration, including views and vistas of on-street shopping activity, is called the blue Ocean plan (Eldardiry & Konbr, 2022).

The preceding research debate on the quality of 'space between heritage buildings' underlined the space's suitability for 'urban outdoor living'. The place is meant for 'urban recreation activities' rather than being left as 'unintended' and 'no man's land (Samadi & Hasbullah, 2008). Designing creative spaces revitalizes urban areas and minimizes crime (Evans, 2009). According to Edwards et al. (2008) a lack of integration between practitioners, researchers and policymakers might result in unfavorable urban settings. The following represents a few of the heritage potential risks to a livable heritage city, resulting in underutilized space in the urban area. To address urban challenges, systematic regeneration must be implemented. Many heritage city administrations designate a developer to carry out such urban design (Yunus *et al*., 2015).

1.2. Research Gap

Heritage preservation principles have broadened their practice, emphasizing preserving larger urban structures rather than only important ones. Heritage preservation and urban restoration for human preferences aim to improve the environment and quality

of life while protecting and preserving areas, assets and cultural values. Currently, the concepts that underpin urban heritage preservation range in numerous ways, including social, democratic and environmental aspects. These values emphasize the importance of establishing integrated approaches and solutions and highlighting issues with regional planning, social fairness and social involvement (Eldardiry, 2023).

In the field of urban design, heritage preservation has a significant role to play. Many studies have emphasized heritage preservation of places, while few studies focus on street heritage preservation and its impact on users' sense of heritage (Khalifa, 2023). In Muharraq city, Kingdom of Bahrain, which is the case of the research, many projects concern heritage preservation at different levels. It has a rationale that aligns with the concepts of place, focusing on heritage areas. There are many important streets in the heritage area in Muharraq and Sheikh Isa Street is one of them. Many efforts have been proposed to improve the streetscape conditions in the heritage area, particularly in Sheikh Isa Streetscape's design. Still, it needs a holistic and continuous approach and implementation of preserving urban heritage, simultaneously designing with the current needs of users that, most importantly, enhance the users' sense of heritage.

1.3. Research Question, Aims and Objectives

The research aims to investigate streetscape design and the role of streetscape in heritage preservation and enhancement strategies, to give users a sense of heritage value for the areas. The applied study is on Sheikh Isa Street. Since it is one of Muharraq's important streets and an essential part of its heritage, it is vital to understand the streetscape design to enable the users' senses to perceive its heritage and cultural values. Consequently, the research question is: How does implementing streetscape design make people perceive a city's heritage?

So, the objectives of the study are the following:
▪ Investigate the relationship between streetscape design elements and their role in enhancing the user's sense of heritage;
▪ Imageability of Streetscape as an important element of urban heritage;
▪ To propose a strategy to examine the relationship between the streetscape and its impact on the human sense of heritage in Sheikh Isa Street.

1.4. Plan of the work

The research used mixed qualitative and quantitative design analysis methods to achieve the primary goal. The data collection methods are as follows: The qualitative methods include one-to-one interviews, observation and surveys; the quantitative method uses the QGIS software. The reason for selecting the innovative software "QGIS" for the research is that The QGIS (Quantum Geographic Information System) is a powerful open-source geographic information system. It can significantly aid in various aspects of sustainable urban maintenance. The QGIS facilitates managing and operating maps for urban spaces at different levels. Spatial Statistics:

Overall, it delivers an adaptable and user-friendly platform for spatial study, visualization and data integration, which can improve the depth and impact of research. It empowers operators, Decision makers, managers, maintenance teams and researchers to perform complex geospatial studies, produce informative maps and communicate research findings visually and compellingly. In addition, it offers various spatial study tools to help analyze areas with high maintenance in specific regions.

1.5. Structure of the paper

The flow of this study's writing is as follows: The first part is the introduction to the topic. The second part reviews related literature, which discusses the setting and the concepts of streetscape and heritage. The third part is the methodology. The fourth part is the results and discussions. The fifth and last part is the conclusion.

1.6. Expected contribution

This paper intends to contribute to the process of designing streets, particularly with heritage as the main concern. It could be done by providing strategies and guidelines for all those involved in the urban design of cities.
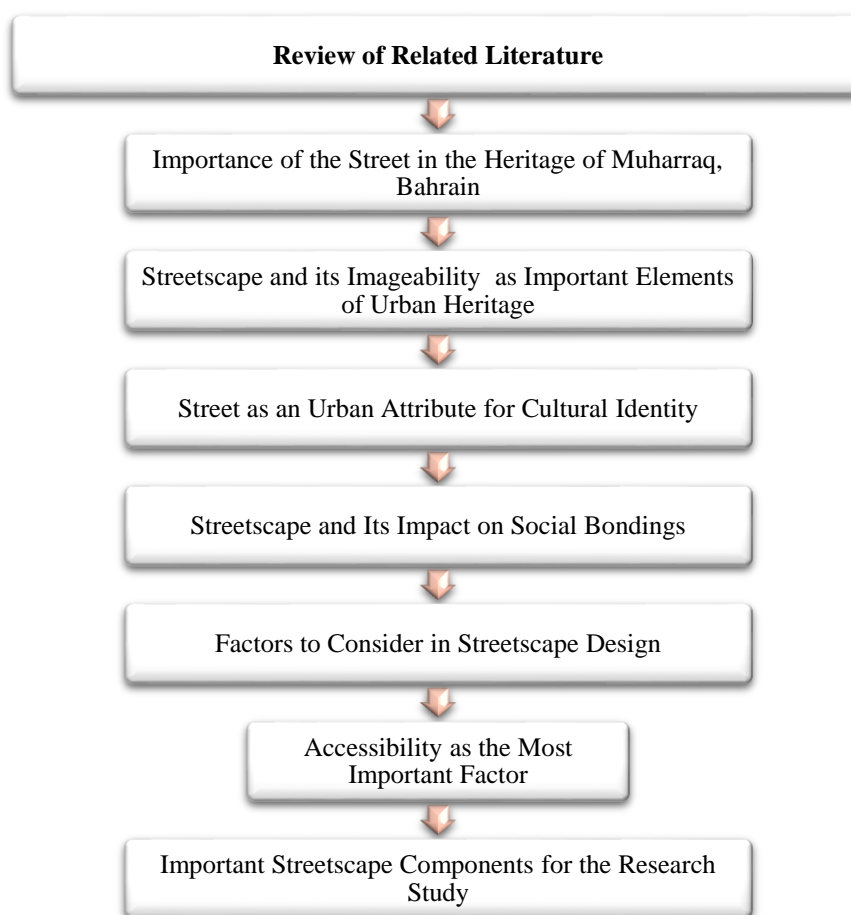

Review of Related Literature

Importance of the Street in the Heritage of Muharraq, Bahrain

Streetscape and its Imageability as Important Elements of Urban Heritage

Street as an Urban Attribute for Cultural Identity

Streetscape and Its Impact on Social Bondings

Factors to Consider in Streetscape Design

Accessibility as the Most Important Factor

Important Streetscape Components for the Research Study

Figure 1. Organization of the Literature Review

2. Literature Review

This section will highlight theoretical points that will help in understanding the value of streetscape functions supporting the heritage areas. It will discuss:
   a. Importance of the Street in the Heritage Areas (Muharraq, Bahrain);
   b. Streetscape and its Imageability as Important Elements of Urban Heritage;
   c. Street as an Urban Attribute for Cultural Identity;
   d. Streetscape and Its Impact on Social Bonding;

e. Factors to Consider in Streetscape Design;

f. It will end with presenting the Important Streetscape Components for the Research Study.

2.1. Importance of the Street in the Heritage of Muharraq, Bahrain

Heritage is shaped by events and activities that occur across time and the locations where these events take place are crucial to the historical narrative. Typically, this refers to the daily experiences of individuals residing in urban areas. There is a prevailing belief that numerous historical structures may be found along the street (Mohamed, 2023).

Muharraq thrived in the 19th century as the capital of Bahrain, then one of the global centers of the pearl industry (El Rashidi, 2019). Muharraq is unique in its preservation of intangible heritage values, a quality that is lacking in other Gulf cities. These encompass customary ways of life, the traditional songs and music performed during different events, such as ancient cultural practices to commemorate wedding rituals and the customary celebrations linked to pearl harvesting (AlSulaiti, 2009). The city of Muharraq's island placement in the northern east of Bahrain has been crucial to the city's urban development throughout history. Since the advent of globalization, the city's primary economic drivers have been the tourist industries and trading, which have contributed significantly to its status as a central hub for commerce for a long time. Muharraq, Bahrain, is home to some of the world's most forward-thinking heritage preservation specialists because of the professional guidance it received from the government of Bahrain in the late 1960s (Hamouche, 2004). Globalization has radically altered the urban morphology of Muharraq, distorting the city's historical center even though Muharraq's early modern planning practice considered the social cohesiveness of the city and its historical significance (Alraouf, 2014). Hamouche claimed that two concrete measures must mitigate the adverse effects of global planning practices on cities with heritage significance.

a. The first strategy is to force non-native players to adapt to local conditions (climate, moral standards, cultural norms, etc.) in an authentic metropolis like Muharraq.

b. The second strategy involves nurturing local human resources via knowledge-based networks (Hamouche, 2004).

2.2. Streetscape and Urban morphology

According to Carmona (2021), urban morphology is one of the practical discussions at the heart of contemporary urban investigations that address the relations between the physical and configurational structures of spaces for social and economic exchanges. There is a synergistic relationship between streetscape design and urban morphology. There is a significant need to fill the gap in studies concerning urban sustainability and urban morphology (Luu *et al.*, 2021). Nevertheless, a conspicuous gap exists in the literature exploring their intricate interplay.

However, what is the vision of urban morphology for improving the streetscape in heritage areas and how is it connected to the heritage characteristics in Bahrain? The vision arises from the appropriateness of the physical definition and scale of spaces in physical analyses related to urban morphology in urban heritage characteristics, especially investigating the urban morphology of street design to achieve heritage perception for visitors, whether tourists or local people. Urban morphology examines the formation of built streetscape environments and the evolution related to urban structures,

land use, open spaces and street patterns. While studying the streetscape in heritage areas, the significance becomes more valuable due to the direct effects upon urban characteristics within such spaces.

Urban morphology encompasses four approaches (Configurational, spatial analytical, typo-morphological and Historico-geographical); therefore, street design is one pivot element in improving urban morphology within cities and comprehensive interest should be directed to urban morphology subjects while studying streetscape and heritage perception.

2.3. Streetscape and its Imageability as Important Elements of Urban Heritage

Wibisono (2001) claims that the streetscape refers to the visual depiction of a street's three-dimensional space, including the appearance and relationships of objects that create the street's personality. Urban streetscapes are crucial since people navigate through them and absorb information from their surroundings to construct views of their environment. The streetscape, particularly the main street, may reflect the city's general character. Lynch (1960) argues that urban shapes and components, such as paths, edges, nodes, districts and landmarks, may enhance a city's image. He discovered that the road, primarily a street, is the most prominent feature since it is the only one that can be identified with the other four. Cities with significant perception-influencing components are more imageable, which is crucial for recognition and identity (Nia & Suleiman, 2017). Identity is shaped by people's visual perception, mental outlook and life purpose on the city's physical look, which starts in its streets. Thus, street design and streetscape affect users and shape their view of the city's character and identity (Barnett, 1982).

The street is part of the public space, which is a place authorities provide for shared use by all residents, visitors or users regardless of their personal, social, physical or cultural differences. They should be free to use, access and see the overall touristic or conservation plan for such areas. Streetscape is one of the fundamental elements in improving heritage areas. When considering the sustainable streetscape in heritage areas, it should be noted that the work is not a simple mission or has a fixed plan and a way of thinking (Hunter, 2009). Still, it depends on the type of heritage area and the leading players involved in the work. The design principles of sustainable streetscapes involve various key stakeholders across different sectors. In terms of technology, tourism, culture & heritage and the built environment, there are vast numbers of leading players, including city government and municipal authorities, urban planners, urban designers, landscape architects, architects, transportation and traffic specialists, technology companies and innovators, destination management organizations, cultural and heritage institutions and authorities, community organizations and NGOs (Hołuj, 2017). Aside from sustainability, inheritability is another thing to consider, especially since a street's heritage is targeted to be preserved (Mazzola, 2019).

Recently, suitable streetscape designs that show the identity of specific places have become more needed in line with the old part of the city development plans, especially in heritage areas. Streetscapes have become a tool for improving heritage ambiance, so if streetscapes are appropriate and meet the objectives of the Bahrain Authority for Culture and Antiquities (BACA) and the local municipalities, they will achieve great success. When designing streetscapes in historical and heritage areas, it's essential to understand several key points to guarantee that the design respects enhancing the unique character and significance of the heritage area (Husain *et al*., 2022). Unfortunately, in such streets,

most of these projects lack appropriate designs that correctly show the heritage issue and the essential considerations of commercial activities and users' needs in such heritage areas. Moreover, social and cultural problems occurred because of the need for open spaces to bring people together to do cultural and social activities. Even so, the design of these inadequate areas of available spaces needs to follow the standards of planning open spaces in such areas. In the last few years, the annual population has increased more and more and at the same time, the green spaces are reduced in such heritage areas, which leads to a threat and deteriorates the residents' quality of life. In the same sequence, here are some considerations.

    a. Sustainability and resilience;
    b. Heritage preservation;
    c. Scale and proportion;
    d. Walkability and pedestrian-friendly design;
    e. Traffic management and civic activities;
    f. Security and safety issues;
    g. Landscape design materials and aesthetics (hard and soft scale elements)
(Hartanti, 2014).

2.4. Street as an Urban Attribute for Cultural Identity

Streetscapes are a part of our daily lives and their designs play an essential role in our city experience. Streetscape designs affect not only the appearance but, more importantly, the functionality of an urban environment (Addas & Alserayhi, 2020). Streetscape not only contains the elements present but also the place's culture in using these elements. Specifically, streetscapes in heritage areas have a vital dimension in the cultural pillars (Citygreen, 2020) . Therefore, Olubi and Aseyan (2022) explain that a cultural streetscape is a remarkable street scene that embodies the local culture. It assists in defining urban forms, enhances urban streets' physical, economic and socio-cultural means, provides street views for buildings and shares communal activities and identities. Moreover, they define the Cultural streetscape (Figure 2) as a remarkable street scene embodying local culture. It helps explain and defend urban forms, improves urban streets' physical, economic and socio-cultural aspects and shares communal activities and identities. Moreover, the significance of a cultural streetscape facilitates ingenious street views, solves ecological challenges and retains the local memory of places (Olubi & Aseyan, 2022). Over a century, efforts to regulate interventions and architectural solutions for cultural conservation have emphasized dynamism over repetition. Few players have accepted its inclusion in international and national charters and keeping historical evidence has always been preferred (Ukabi & Akçay, 2023).

Figure 2. Remarkable Street scene embodying local culture (by authors)

Olubi clarified that the cultural landscape helps define and defend urban forms, improves the physical, economic and urban situation, solves environmental challenges and preserves local memory. Shaping local place identity and maintaining its sustainability (Olubi & Aseyan, 2022). Fadamiro and Adedeji (2015) explained that cultural streetscapes act as a capture between the natural and the mind. Moreover, its design aims to embrace its value and importance in a sustainable character that creates meaning and identity (Figure 3). Its advantages include providing a sense of familiarity and direction and stimulating individual and urban street interactions. Koo explained that the streetscape refers to the collective appearance of the buildings, pedestrian walkways, parks and landscaping extending along the street (Job & Elghonaimy, 2022). A streetscape is a visual identity that encourages people to live in a specific area.

Figure 3. The cultural streetscape in heritage areas, Diriyah Gate Development project

Laura Frank explained that contemporary theories and concepts of streetscape design offer opportunities to create socially sustainable and lively streets, fostering social interaction among community members (Frank, 2010). The theory of cultural streetscape identifies the role of streets in illustrating and expressing local cultures. It highlights the need to incorporate cultural elements such as historic street viewpoints, traditional architecture and indigenous symbols in the design process (Al-Haddad & Elghonaimy, 2019). This concept highlights the necessity to create streetscapes that convey a sense of place and develop meaningful experiences for the community while also addressing environmental issues and maintaining the memory of local heritage. The cultural heritage (Figure 4) must be maintained, retained and preserved as a significant part of the memory of the nations and local identity in addition to the cultural cityscape through hybridization, sustainability and coherent and conceptual artistic designs (Olubi & Aseyan, 2022).

Yet, the design of streetscapes in heritage areas requires incorporating significant traditional architectural features and cultural streetscape elements that could sustainably improve artistic inclination (Nia & Suleiman, 2018). The appropriate streetscape contributes to the growing knowledge of place identity and the preservation of local design ideologies (Olubi & Aseyan, 2022). Beyan and Gürkan (2015) state that streets inside cities show various social characteristics and urban changes, which count on time and space. Madinipour (1996) demonstrated that while examining street furniture projects, landscape architects set time, place and activities as meaningful considerations in the first phase due to the high value of influencing the qualitative interpretation of the voids and spaces at the forefront of these considerations.

In Guangzhou City, a novel triangle framework was used in designing the commercial streets, consisting of three dimensions: accessibility, serviceability and suitability. Accessibility refers to the ease of connecting the recreational areas and

serviceability concerning the availability of amenities and facilities and suitability concerns the appropriateness of the built environment for recreational activities (Shi *et al*., 2023). According to Venerandi et al., most people will pay more for a well-connected house near local amenities and away from noise, pollution and one-way streets (Venerandi *et al*., 2018).

Figure 4. Streets with cultural dimensions

It should not impose discriminatory burdens on the types of users who can access them or the purpose for which they can be used. The theory of contextual streetscape aims to incorporate projects in the heritage areas and landscape architectural design elements within the streetscape's cultural fabric (Figure 5). This method encourages harmonious designs that consider the historical context, landscape architectural styles and spatial relationships in their surroundings. It stresses preserving the streetscape's integrity and consistency while handling current anticipations and functions (Olubi & Aseyan, 2022).

Inspired by Souq Waqif, (Figure 6) Lange and Rodrigues (2021) ensure that Urban green spaces are essential for streetscape in the heritage zones when emphasizing sustainable development amid proper population growth and urbanization. Consequently, it urgently improves the lifestyle of dwellers near such streetscapes significantly. It acted positively in preserving heritage and enhancing urban living standards. In addition to creating vibrant, culturally significant spaces, balancing heritage with modern amenities and green practices.

Figure 5. Contextual streetscape

Figure 1. Souq Waqif, Old Doha, Qatar, Urban green spaces and sustainable streetscape
Source: Furlan & Al-Mohannadi, 2020

While Al Fahidi project, Al Bastakiya zone, Dubai City, UAE (Figure 7), streetscape in the heritage quarter aimed to create a cultural and urban tourism destination and preserved heritage and traditional way of life. As a result, the old houses have been turned into cultural centers and guest houses (Dubai Culture and Arts Authority, 2021). The appropriate green streetscapes within commercial streets are not simply luxuries but vital for our well-being, environmental balance and streetscape vitality. By thoughtfully designing, maintaining and utilizing these spaces, we can create healthier, happier, more sustainable streets and friendly environments for future generations (Lange & Rodrigues, 2021). The theory of streets inside historic areas serves three corresponding purposes: social gathering places, marketplace and commercial activities (traditional souq) and mixed-use places. As a social gathering place, the open spaces provide a suitable environment for social exchange at different levels. As a marketplace, the streets within the urban space facilitate commercial accomplishments at different levels. In addition, the mixed-use public spaces attached to such streets allowed the influences between all the functions (Gehl *et al*., 2006). Therefore, streetscape in the heritage areas within the old parts of the towns and cities should be more practical and have a positive role in improving the urban environment, responsive to give a sense of identity and belonging to the local residences and the secure and safety movements for the users in addition to intelligent urban space. Moreover, it should influence the revitalization of Bahrain's identity (Olubi & Aseyan, 2022).

Figure 7. Streetscape in the Heritage Quarter, Fahidi, Al Bastakiya, Dubai City, UAE (Alhasawi, 2019)

However, better places can be achieved when cultural beliefs and elements are incorporated into the architecture of the streets. Such strategies include making Old

Muharraq City legible and memorable, preserving history and restoring local place design elements with native identities. For example, it should consist of native softscape elements such as planting trees with cultural value and local history and using locally carved street benches, among others (Olubi & Aseyan, 2022). In addition to using appropriate hardscape design elements that have an antique appearance to match the local ambiance for the street, for example, erecting memorable local and ancient sculptures (statues) at strategic locations along the streets and remodeling places of history within the roads as tourist centers (Figure 8). Moreover, showing cultural belonging, for example, naming streets after local heroes and events, will create a comprehensive streetscape model in heritage areas (Olubi & Aseyan, 2022).

Figure 8. Antique appearance to match the local ambience for the streetscape design

In the old part of Muharraq City, as in most historical areas worldwide, street furniture plays a significant role in presenting the identity and belonging of the residences, positively influencing the open space conditions and the visual quality (Elghonaimy, 2020). In Bahrain, there is a strong emphasis and concern towards preserving the historical areas as a significant factor in supporting the national economic resources in Bahrain 2030 (Bahrain, 2008).

2.5. Streetscape and Its Impact on Social Bonding

Koo (2017) identified that streetscapes aim to provide and support community inventions for social interchange and achieve general purposes such as safety, security, economic health and cultural and social destinations. Streetscapes contribute to continuing feelings of communities and places. Public spaces that are interesting, engaging and comfortable attract and retain visitors (Holland *et al.*, 2007). For example, improvised "street entertainment" draws attention and defines a place. People stay longer if there are comfortable places to sit, especially if they are protected from the elements (Mehta & Bosson, 2010). Local culture, lifestyle, expertise and craftsmanship on traditional streets, like Melaka's Jonker Street in Malaysia, add vibrancy, curiosity, pride and unity (Ab Rahman *et al.*, 2018).

Markets, street sellers, shops and sidewalk cafés are examples of public and semi-public spaces that provide the terrain for social interaction and much of city trade (Montgomery, 1998). Urban encounters are low-density because they rely on sight and sound to communicate. Short conversations between users increase interaction density and teach them about the world (Gehl, 2003).

Social engagement involves neighborly emotional support and networks. The

exchange of services or products characterizes strong social links, while casual pleasantries characterize weak ties (Talen, 2016). Urban sociality is contingent upon and interconnected with the production and dissemination of tangible artifacts (Amin, 2009). This concept is enlightening as it demonstrates the essentiality of establishing and maintaining trust in the functioning of public and communal domains. The notion of social surplus offers a way to express the idea that confidence and an understanding of the variety in the environment can develop through regular, practical social contact in a common location (Latham & Layton, 2019).

2.6. Factors to Consider in Streetscape Design

Architect Nandita Baabu lists factors that must be depended on in designing streets. They are (1) people-first design, (2) accessibility, (3) safety, (4) walkability, (5) participatory appeal, (6) topography, (7) network of streets, (8) flexibility, (9) ecosystem and (10) utilities. (Baabu). The most important of these is accessibility (Eldardiry, 2022).

Accessibility is the most important factor; it refers to the level of ease with which individuals with various impairments can enter and navigate public spaces. In the context of a city, accessibility refers to factors such as efficient traffic management, well-planned public transit systems with appropriate stations and streets that are constructed to be easily navigable for pedestrians (Kozlova & Kozlov, 2018). Given the significance of a public space's vibrancy for its inhabitants, it is crucial to thoroughly assess, analyze and improve accessibility for individuals of all ages and varying physical capabilities. (Stauskis & Eckardt, 2011). In a 2018 roundtable discussion organized by Middle East Architect and Commercial Interior Design, Samer Touqan, the project's director at Dewan, highlighted the tendency to focus solely on wheelchair users when addressing disability in design. He pointed out that individuals with other disabilities, such as visual and hearing impairments, are often overlooked (Alsammarae, 2018).

Connectedness refers to the relationship between circulation and spatial links, while access pertains to the visibility and approachability of a location (Bigdeli Rad & Bin Ngah, 2013). These factors might affect the function and safety of the area. Accessibility, mobility, inclusion of particular social groups such as children and seniors at various locations, sufficient parking and a reliable public transportation system are all crucial factors. Talen (2016) proposes that the enhancement and increased availability of public areas can potentially foster social interaction, resulting in an improved sense of community. Anticipated along the route are interactions with other components and indirect consequences. Pedestrian movement issues hinder accessibility in heritage areas. The following is a list with suggestions on how to resolve them.

a. Friendly design issues: Prioritize the pedestrian experience by designing z systems in interpretation and tour map: Consider incorporating intelligent systems in the tools and devices in interpretive elements, such as plaques, signage or murals, that provide historical context and educate visitors about the area's heritage value.

b. Safety: Emphasize safety by ensuring uninterrupted sidewalks, appropriate lighting and accessibility in compliance with ADA standards. In addition, create inclusive streetscapes that allow people of all abilities to move comfortably.

c. Pedestrian experience: Sidewalks should be wide enough to accommodate pedestrians, outdoor seating and street vendors and enhance the area's walkability by incorporating amenities such as benches, planters and public art.

d. Bicycle Infrastructure: Integrate bike lanes or shared-use paths to encourage

cycling as a mode of transportation, install secure bike racks and consider implementing bike-sharing stations (Ordoñez, 2023).

2.7. Important Streetscape Components for the Research Study

This section has gathered the most essential elements of streetscape that are referred to in this literature review as important elements for the user's perception of space (Figure 9). These components will help analyze the study site and evaluate their prevalence on the site. Table 1 summarizes these streetscape components and their supporting references.

Figure 9. Landscape Architecture design elements

Table 1. Important Streetscape Components for the Study

Streetscape Components	References
Landscaping	The Importance of Landscape Architecture and Ornamental Plants in Sustainable Cities (Hatipoğlu & Ak, 2020)
Walking and cycling tracks	Pedestrian-Friendly Streets: Assessing Overall Success on Well-Being with Post-Evaluations (Ordoñez, 2023)
Accessibility and connectivity	Ten quality criteria of public spaces in a large city (Kozlova & Kozlov, 2018)
Commercial activities integration	Making a city: Urbanity, vitality and urban design (Montgomery, 1998)
Social and cultural elements in streets	Cultural Streetscape: Its Value-System, Space and Significance in Oyo Town, Nigeria (Olubi & Aseyan, 2022)

3.   Materials and Methods

3.1. Research data analytical methods

Urban heritage results from an interconnected network of connections between the built environment from the past, its functions and activities and the symbolic and meaningful elements of the city in the present. This idea determined the selection of the research site.

As for the conducted method, the research used mixed qualitative and quantitative analytical methods for data analysis to achieve the objectives of this research. A mixed-methods design enables essential instruments for combining views that, when put together, can provide a more comprehensive knowledge of social activity, as well as the

implementation and additional advancement of concepts that provide explanations for intricate events that occur across various levels of investigation.

The research employs a qualitative case study approach, collecting primary data from participants through in-depth interviews and observations. Interviews were carried out to learn about and analyze people's experiences in the areas of study. Simultaneously, the researcher attempts to acquire qualitative data on the user's behavioral patterns in the sites under study. An open-ended, semi-structured interview was selected because interviews are the most effective method for conducting urban ethnographic studies. In terms of qualitative investigation, a semi-structured interview allows end users to directly participate. Respondents were experts who are well-experienced in heritage design as well as the site itself. The semi-structured interview captures the revitalization approach, routine behavior and decision-making on the sense of heritage and how to revitalize the streets.

This study used qualitative research to collect participants' opinions, actions and experiences. The goal was to understand people's attitudes, behaviors, beliefs and experiences by collecting and analyzing non-numerical data (Hassan, 2024). Open-ended questioning addresses the hows and whys of clarifying human behavior patterns and processes at Sh. Isa Street. One benefit of qualitative research is Isa Street, which can be challenging to measure. It can help us understand the data or results of quantitative analysis more thoroughly and more fully. Both stand-alone studies that exclusively use qualitative data and mixed-methods studies that incorporate qualitative and quantitative data can incorporate qualitative research (Tenny *et al*., 2022).

3.2. Data collection methods

Data collection methods used in the qualitative study were visual observation, data gathering and interviews with different types of users on the street. The qualitative study was selected to understand Sh. Isa Street's issues better. The interview questions are categorized into two sets and each set aims to achieve the objectives of the study. The qualitative data collection method was acquired through focus interviews. Since the commencement of the investigation, recordings of input data have been collected for data analysis purposes.

The recorded interview session was then transcribed using the online application Otteri, and later, it was categorized based on emerging themes within the Miro board.

a. Qualitative Research Methods

i. One-to-one Interview: In this approach, within the research, a single person is interviewed to comprehend their experiences, attitudes and views fully. These interviews took place via video conference and in person. Typically, the interviewer offered open-ended questions to allow the respondent to share their thoughts and emotions. One helpful way to gain a thorough grasp of human experiences is through individual interviews (Bhandari, 2023). The interviews were done with landscape architects, people in authority, employee in the Manama municipality and a random number of visitors to the street.

ii. Observation: In this approach, interactions and behaviors in natural environments and settings are observed and documented. The researchers played the role of the observers by visiting the street at different times and accusations. They used audio, video recordings, notes and photo (Husserl, 2012). The process of observation helps comprehend cultural customs, social interactions and the environments in which activities

occur (Gill, 2020).

b. Quantitative Numerical Research Methods

QGIS software was used to sort the data and present it in a useful way. The reason for selecting the innovative software "QGIS" for the research is that The QGIS (Quantum Geographic Information System) is a powerful open-source geographic information system. It can significantly aid in various aspects of sustainable landscape maintenance. Moreover, the QGIS facilitates managing and operating maps for urban spaces at different levels, which are:

a. Spatial Data Analysis: QGIS allows researchers to import, organize and examine spatial data, such as satellite imagery, topographic maps and GIS layers. QGIS allows examining landscape features, land use patterns and vegetation allocation within the study areas, delivering practical spatial insights.

b. Geospatial Mapping: QGIS allows the invention of high-quality maps and visualizations, enabling the effective presentation of research findings. Combining digital maps developed in QGIS can illustrate the locations of case study sites, spatial patterns of landscape elements and digital tools and infrastructure allocation.

c. Identifying Suitable Restoration Sites: For projects related to ecosystem rehabilitation and green infrastructure, QGIS can help identify appropriate locations for rehabilitation efforts based on environmental factors, land suitability and ecological potential. Consequently, it facilitates preparing maintenance maps for such areas.

d. Data Integration: QGIS can integrate miscellaneous data sources, such as climate data, soil characteristics and water resources, to produce extensive geospatial databases to enable the supervision map. This integration allows the maintenance team's specialists to analyze the associations between environmental variables and the impact of digital tools on landscape sustainability.

e. Visualization of Monitoring Data: QGIS can be utilized to visualize monitoring data gathered from remote sensors and IoT devices. This can help the maintenance team better understand the spatial allocation of data, movements over time and lifetime, as well as the period needed to maintain the infrastructure and the landscape architecture design elements in the spaces.

f. Spatial Statistics: QGIS offers various spatial study tools to help analyze areas with high maintenance in specific regions.

g. Public Participation and Citizen Science: QGIS can produce interactive maps or web-based applications that amuse the public by noting landscape maintenance issues and contributing to community involvement and data collection through citizen science initiatives.

h. Decision Support System: QGIS can be the territory of a decision-making system for landscape management and policymakers, as well as the maintenance map and optimal resource allocation (Husain *et al*., 2022).

Therefore, after the literature review, it comprehensively analyzed past research on integrating digital tools and data analytics in landscape maintenance practices. Consequently, the research methodology using Spatial data analysis within the framework of QGIS offers a comprehensive suite of tools for importing, managing and analyzing diverse forms of spatial data, including satellite imagery, topographic maps and GIS layers.

Through integrating QGIS, a profound exploration of Streetscape features, land use patterns and the dispersion of vegetation across designated study areas to document Users' Sense in Heritage Areas becomes manageable, stimulating crucial spatial understandings.

QGIS's capabilities extend to generating high-caliber maps and visualizations, providing a powerful means of effectively communicating study findings. Using digital maps generated within QGIS, the positioning of case study sites, the spatial distribution of the streetscape components and the layout of digital tools and infrastructure can be clearly illustrated.

Incorporating the QGIS application into the management of streetscape projects is described through an organized series of steps coordinated to enhance the efficiency and sustainability of the project. The outlined process incorporates the following stages:

a. Data Compilation and Integration: The initial phase includes in-depth Sh. Isa Street data and information gathering. This includes accurate drawings, coordinates and specifications for all items essential to the landscape street's overall structure.

b. Data Analysis and Categorization: Subsequently, the collected data is accurately analyzed, leading to its categorization into major domains: visual study, Infrastructure, Hardscape elements and Softscape elements, etc.

c. Digitization within QGIS: The transition to digitization is executed within the QGIS application. This initiated the creation of a primary project file, designated by the project name, such as "Heritage Areas" or "Sh. ISa street", which will mark the site on the map Figure 11. Within this file, three exclusive sub-files are established to correspond with the earlier delineated categories: Infrastructure, Hardscape elements and Softscape elements Figure 12.

3.3. Ethical considerations

The study considered ethical considerations, such as informed consent, confidentiality of the data about the interviewer and other personal data (Rawat, 2021). A Google form was created with a brief description of the research problem and provided to the interviewee. Once the researcher received the consent via Google, the venue was decided through a phone call to carry out the interview. Before starting the interview, the researcher acquired verbal consent once again to record the interview session, which was also provided in the Google form. The researcher made sure the interview is focused and within the time frame of 45 to 60 minutes.

The interview used a well-planned questionnaire that allowed respondents to respond quickly and reflect on their real-world experience managing a business on Heritage Street. The first half hour of the interview was dedicated to maximizing the opening session in business operations. The store owners' or operators' routine usually begins as early as possible, between 7:30 and 8:00 a.m. The output data were useful in building the QGIS modeling for Sh. Isa Street.

3.4. Limitations

The research's limitations were towards Sh. Isa Street is a sample of the streets across the heritage area (Figure 10).

Figure 10. Shaikh Isa Avenue Road, Micro approach
Source: Google with editing by the authors

3.5. Study Site

Muharraq is a densely populated island city in the northwestern part of Bahrain. The Shaikh Isa Avenue Road is located in the heart of Muharraq and connects it to important landmarks such as Shaikh Isa Bin Ali House and Muharraq Souq (Figure 11). The road is at the intersection of Muharraq Souq and spans from the island's beginning towards Alkazino Park. It runs in close proximity to the Pearling Path and is lined with historic buildings, schools, hospitals, retail shops and mosques.
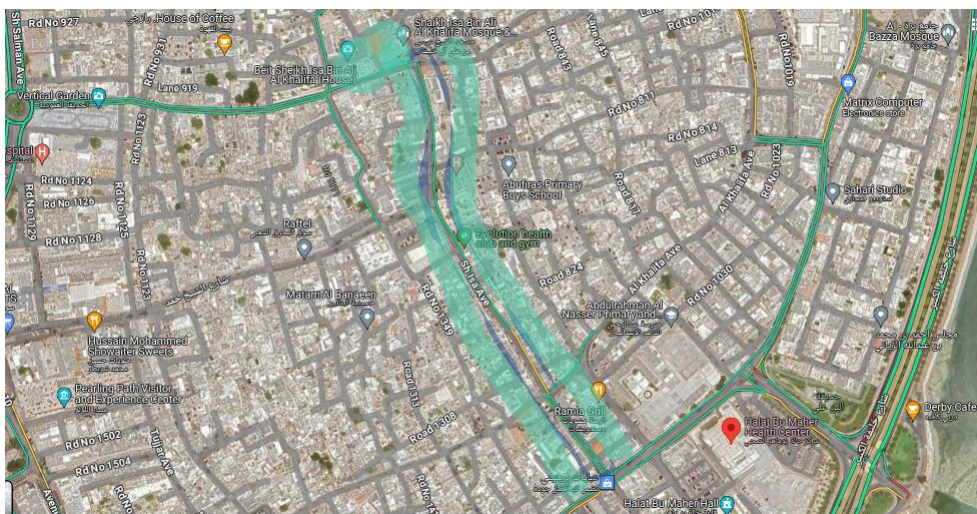

Figure 11. Shaikh Isa Avenue Road, Micro approach
Source: Google with editing by the authors

As shown in figure 12, Sheikh Isa Street is in Muharraq and it has a rich cultural history and historical significance. The scene, located in the center of Muharraq, is surrounded by original traditional buildings, historic mosques and lively marketplaces. It offers tourists a unique view of Bahrain's history and has a peaceful environment.
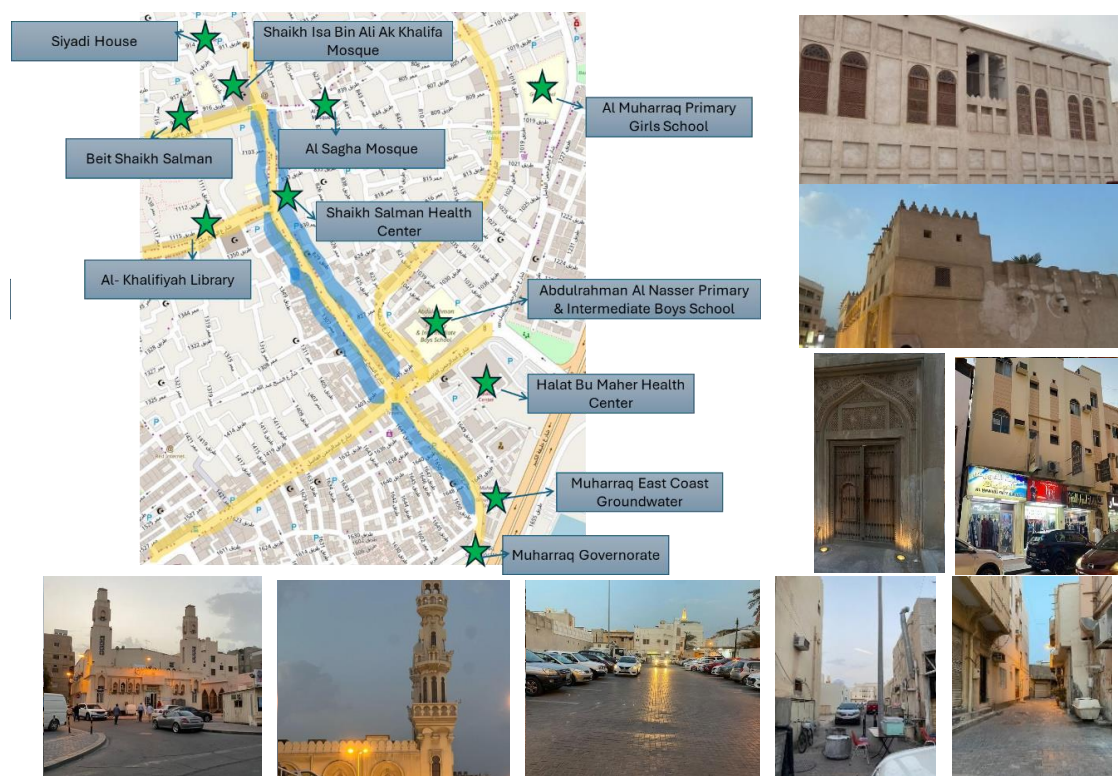

Figure 12. Visual studies
Source: By Google and authors

4.   Results

The results of this study were collected through two means: interviews and observations. The interview was done with an expert on the topic using semi-structured open-ended questions. The data collected from interviews shows that the site itself and its streetscape are the most important elements of Sh. Isa Street is crucial for enabling cultural and historical values which are currently deteriorating. It shows that the site and main streetscape design were the important elements of Sh. Isa Street enabled cultural and historical values, which are currently deteriorating.

4.1. Interview Findings of the Site's Historical Values

The following are some cultural and historical traditions associated with the use of outdoor spaces on Sheikh Isa Street in Muharraq:

a. Majali's: Sheikh Isa Street is famous for its traditional Majali's or outdoor gathering spaces. Majali's are large open squares or courtyards surrounded by traditional Bahraini buildings. They have historically served as places to socialize, discuss important matters and host cultural events. People would gather in assemblies to exchange stories, participate in discussions and enjoy musical and poetic performances.

b. Al-Qaisariya Market: Al-Qaisariya Market is located on Sheikh Issa Street. It is a historic market that has been a center for trade and commerce for centuries. The market's outdoor spaces were used as trading areas where merchants and artisans displayed their goods, such as textiles, spices, jewelry and handicrafts. The buzzing atmosphere and lively outdoor stalls have made it a popular destination for locals and visitors alike.

c. Community Gatherings: Outdoor spaces in Sheikh Isa Street have always been important gathering places for the local community. Families and friends would come together to enjoy picnics, barbecues and outdoor meals. Children would play games and engage in traditional activities, fostering a sense of community and cultural bonding.

d. Festivals and Celebrations: Sheikh Isa Street has been a venue for various festivals and celebrations throughout history. During religious occasions like Eid al-Fitr and Eid al-Adha, the street would come alive with vibrant decorations, traditional music and dance performances. These festivities often spilled out into outdoor spaces, with colorful processions and parades taking place along the street.

e. Traditional Sports: Outdoor spaces in Sheikh Isa Street have also been used for traditional sports activities. One such sport is "Al-Mahafazah", a form of horse racing. Historically, horse races would take place on the streets of Muharraq, including Sheikh Isa Street, where spectators would gather to cheer on the riders. Traditional wrestling, archery and other sports were also practiced in outdoor spaces.

These are just a few examples of the historical traditions associated with using outdoor spaces on Sheikh Isa Street in Muharraq. The street continues to be a significant cultural and historical landmark, preserving Bahrain's traditions and heritage.

The site included commercial activities such as markets for household supplies, several markets for abayas, a bus stop area, parking lots and many schools and mosques.

4.2. Interview Findings of the Observation

The data gathered through qualitative and quantitative methods showed that the current design of Sheikh Isa Street needs enhancement in various disciplines of urban design to enable a sense of heritage through the streetscape. The results were gathered based on the objectives of the research.

Objective 1: To investigate the important streetscape design elements **that are necessary for preserving heritage**

The research shows that the streetscape elements, which were supposed to be present, were missing. A common thread that emerged from the interview was the importance of the individuals' continued social connection to Muharraq's heritage through its outdoor majlis sitting arrangements. The observation showed the discomfort with their walking experience because of the difficulties of doing errands, the lack of vistas, shaded locations and urban green spaces. There's also a lack of physical features that stimulate the sense of heritage and social character. According to the interview findings, people's walking habits in the streets are affected by how close and easy it is to reach the services' locations. Findings also show that accessibility is crucial in the street. Sh. Isa Street causes a difficulty in walking to get to public facilities because the roads are too small. The inaccessibility of these locations is brought to light by this. The interview further finds that modern construction is expanding into and around the site, destroying the distinctive townscape features of historic architecture, social activities and their human size. Furthermore, insensitive set-back measures implemented with the goal of growing the street throughout years have resulted in the destruction of several original

structures.

The observation showed that problems arise in public settings due to street vendors. They litter public areas and roadsides with their trash. They refuse to be held responsible for cleaning up trash. They aim to establish up shop near business areas or on busy crowds. Large crowds congest the streets and pavements, making it difficult for pedestrians and drivers to move around and park. On public locations in cities, not all street sellers have the same chances. One may amass a considerable fortune by securing a large plot of land in a highly trafficked business area. Meanwhile, there's a low-profit enterprise running in a cramped location near a neighborhood junction all day long. There is a great need to revitalize the streets from a commercial point of view. Creating proper designated areas for vendors and implementing urban regulation would make them not exceed their vending capacity that blocks walkability.

Objective 2: To investigate the relationship of the streetscape and its impact on the human sense of heritage in Sheikh Isa Street

There is a complex and important link between streetscape and how it affects individual perceptions of heritage. Everything about a street or urban setting, from its architecture and urban design features to its landscaping and general atmosphere, is considered part of the streetscape. The findings from interviews and observation show that essential attributes help people perceive their sense of heritage.

a. **Influence on the eyes:** While observing the site, the researcher discovered that monuments, buildings and other artifacts representing a community's past are commonplace in streetscapes. Building materials, architectural styles, street furniture and public art are all visual aspects that help to create a feeling of continuity with the past. When they come across these components, people form a visual bond with a place's cultural identity and historical story.

b. **Emotional connection:** The interview findings show that people might feel a rush of nostalgia, pride or belonging when they see streetscapes thoughtfully designed to include or maintain cultural components. There is a sense of belonging and connection with the past when one sees historic facades, conserved monuments and conventional city plans.

c. **Sensorial experience:** Streetscapes have an effect on people's senses beyond sight. The audible elements of a historical street, like the ringing of ancient church bells, the reverberation of footfall on cobblestones or the rumbling of vintage trams, may trigger aural memories and add to a sensory experience that strengthens the legacy identity.

d. **Cultural identity:** One interviewee states that streetscapes portray a community's culture through their design. Culturally significant places in the streetscape, such as ethnic enclaves, traditional marketplaces or religious structures, may help inhabitants feel more connected to their city and its history.

e. **Sense of time and place:** The interview revealed that maintaining historical streetscapes gives people a sense of place and time by connecting them to bygone periods and illuminating how their neighborhood has changed. Because of this continuity, the historical significance of the cityscape is better understood.

f. **Involvement of the community:** During the observation, it was found that historic streetscapes often serve as meeting places for locals and visitors alike, drawing in many cultural events and tourists. They are community hubs where people congregate to honor history, tell tales and create lasting memories.

5. Discussions

Sheikh Isa Street is located in Muharraq, Bahrain and is famous for its rich historical and cultural importance. It has been a center of outdoor activities and traditions for many years. It is primarily known for its traditional market, surrounded by conventional old buildings on the pearling pathway. Coordinating the street's heritage and cultural attributes is sometimes overlooked in some levels of concern. Moreover, as explained earlier, the study tried to Investigate the urban morphology of streets in the historical part of Muharraq city and took sh. Isa Street is a focal point of study as a qualitative study to demonstrate heritage perception by users via appropriate design for the streetscape.

Finding from the literature review, the study showed that urban morphology, the scholarly study of the shapes and structures of human settlements and the processes that drive their formation and transformation, has emerged as a pivotal field of investigation in both educational and professional realms. This discipline finds relevance in many domains: urban design, urban planning, architecture, geography, heritage and land conservation, archaeology, landscape architecture, anthropology and the history of cities. This research highlighted the profound relationship between the streetscape design elements and the social aspects of the urban morphology of the historical areas.

Moreover, the study illustrated that urban morphology encompasses four approaches (Configurational, spatial analytical, typo-morphological and Historico-geographical). Therefore, street design is one pivot element in improving urban morphology within cities. Moreover, The Urban morphology in the historical areas can be categorized into three fundamental applications:

• As an investigative technique, it discerns and interprets urban changes, enabling stakeholders to comprehend overarching shifts within the urban landscape.

• It functions as a diagnostic tool, facilitating studies into the structural elements that underpin thriving cities.

• It also provides a framework for defining urban design models, patterns or components that can be assimilated as design entities.

Despite its simplicity, Sh. Isa Street is a cultural area representing a landmark and cultural identity. This is what determines the importance of the area to the residents as well. It retained its cultural and heritage identity, as it was the focus of traditional sporting activities, such as the Sukuina. The following are the main emerging themes from the data findings:

a. Revitalization Through Street Furniture

Street furniture is an approach to revitalizing urban area that aims to improve the aesthetics and functionality of public places to make them more inviting and enjoyable. Benches, seats, lights, planters, bike racks and trash cans are all examples of street furniture that are deliberately placed in public places.

The results from qualitative and quantitative data show that currently, the street lacks this urban furniture. The negative points concluded from the inventory showed the deficiency of using the hardscape design elements in terms of the shortage of seats to serve visitors when they walked the entire street; there is the absence of considering the universal design in the streetscape with expecting danger and severe fatigue from them. On the other hand, the electricity wires extending from one store to another on the building facades also cause great danger to visitors when they pass under them, especially in rainy weather.

Lighting fixtures and strategically positioned benches are examples of well-planned street furniture that may improve the security of public spaces. By creating well-lit areas with good sightlines and designated meeting sites, crime may be reduced and inhabitants' feelings of safety can be enhanced.

One way to honor and maintain a community's heritage and customs is through street furniture. Incorporating local themes, traditional handicrafts or historical buildings into designs fosters a feeling of belonging and pride in the community.

b. Revitalization Through Street Cultural and Heritage Attributes

As a result of the inventory and analysis, Sh. Isa Street needs more social gathering spaces and to increase its heritage features. The Sh. Isa streetscape should provide opportunities for different social interactions and cultural events. It also serves as an important node for the urban infrastructure and transportation systems of the Kingdom of Bahrain. The well-designed space will enhance the urban livability of Muharraq city and engage in community well-being (Imam *et al*., 2023).

It needs to improve its heritage roles to revitalize the history of Muharraq. From the pilot questionnaire, some respondents expressed their need for various gathering places with an archaeological and cultural character that enhances the region's culture. Therefore, this study emphasized that the entertainment element can be added to the venue (the streets of the Muharraq area) by exploiting the spaces and designing them to suit the venue and serve visitors. The theme of improving the streetscape conditions, inspired by Olubi and Aseyan (2022), explains that to improve the streetscape, it is essential to consider a theme that aligns with the Bahrain context and culture while enhancing the overall aesthetics and functionality of the area. One possible theme that could be implemented is the infusion of cultural streetscape elements into the old and new street design and it is explained that to improve the blend of traditional Bahraini architecture and modern urban design, to create a harmonious balance between the prosperous cultural heritage of Bahrain and the contemporary aspiration of the city (Olubi & Aseyan, 2022).

Preserving a city's historic buildings and other artifacts is undeniably essential for a neighborhood's character. People living in cities frequently feel more at ease and secure when they visit locations with personal significance or rich history. These elements are crucial to ensuring a society's cultural survival. However, the richness of past events and cultural legacy makes one wonder at what cost.

c. Revitalization Through Street Commercial Activities

The observation showed that the historic area's allure stems mainly from the many events happenings there, which enhance people's sensory perception of the streetscape by stimulating their senses of scent, sight, sound and emotion. The street re-design efforts should consider the market-related activities that may be seen in the ancient city center. An example of this is the Arabian souqs (marketplaces) being located near a mosque, which are the Muslims' place of worship (Elsayed *et al*., 2019).

d. Revitalization Through Street Plantation

The study findings elaborate on the lack of plantation and its urgent requirement. Moreover, when looking at the eye-level green spaces, there has to be more of them. The streetscape needed to be performed appropriately. While doing the site observations, it was found that the current landscaping is almost none, making streets dull and not providing any stimulating effects on users.

Urban greenery makes streetscapes and public places more attractive and welcoming. According to research, natural surroundings and green areas reduce stress,

anxiety and sadness among the residents. Diverse plant species in urban greening offer habitat and resources for birds, insects and small animals. This supports urban biodiversity conservation and ecological resiliency. Street plantation programs generally incorporate community tree planting and maintenance. Residents develop a feeling of ownership, civic pride and social cohesiveness, forging communal relationships and providing common places for leisure and interaction. Tree-lined roadways and well-maintained green areas increase property values and attract companies, residents and visitors. Natural shade and cooling minimizes energy bills, saving the money of people and communities. By sequestering carbon dioxide from the atmosphere and storing it in their biomass, trees and plants help mitigate climate change. Urban greening helps fight climate change locally and globally.

e. Revitalization through accessibility and connectivity

Creating vibrant, inclusive and functioning communities requires improving street accessibility and connection. This method emphasizes making streets accessible to everybody, regardless of age, ability or mode of travel, to improve urban mobility. The following are key advantages of street revitalization via accessibility and connectivity.

i.   **Pedestrian Elements:** Walking is safer, easier and more comfortable when streets are designed for pedestrians. Wide, well-maintained sidewalks, accessible curb ramps at crossings, tactile pavement for the visually impaired and enough nighttime illumination are examples. Pedestrian-friendly streets promote walking and physical exercise, promoting public health.

ii.   **Cycling Infrastructure:** Dedicated bike lanes, bike-**sharing** programs and safe bike parking promote cycling as a sustainable and healthy means of transport. Cycle infrastructure reduces traffic, air pollution and greenhouse gas emissions while allowing citizens with a cost-effective means to get about town.

iii.   **Public Transit Integration:** Bus stops, tram stations and tube entrances should be integrated into streets. Well-designed transit stations with shelters, seats, real-time information displays and accessible walkways boost transit utilization and reduce vehicle use.

iv.   **Universal Design Principles:** Universal design makes streets accessible to all ages and abilities. This involves planning for wheelchair users, mobility-impaired people, stroller-wielding parents and elderly persons. Level walkways, tactile warning strips, auditory crossing signals and clear signage improve accessibility for all users.

v.   **Mixed-Use Development:** Mixed-use zoning and development revitalize streets by encouraging residential, commercial, cultural and recreational uses. Mixed-use streets boost local economies, support local companies and create walkable neighborhoods where people live, work and socialize.

vi.   **Green Infrastructure:** Street trees, rain gardens and green roofs manage runoff, reduce urban heat islands and enhance air quality. Green spaces along streetscapes offer shade, decrease noise and beautify urban areas, improving inhabitants' and tourists' well-being.

vii.   **Community Engagement and Placemaking:** Involving people, companies and stakeholders in planning and design encourages ownership and pride. Public art installations, sitting areas and community activities offer pleasant public places that promote socialization and cultural exchange.

viii.   **Safety and Security:** Clear sightlines, well-lit paths and busy shops improve pedestrian and bike safety. Crime prevention through environmental design (CPTED) techniques, including minimizing blind spots and improving natural monitoring, make

cities safer.

The site analysis shows no relationship between the built environment, commercial streets and the streets in terms of dimensions, accessibility, service and convenience.

f. Strategies for streetscape design in urban design and heritage preservation

The findings also provide some essential strategies for urban design and heritage preservation. When combined, these themes can enable a sense of heritage. Historic environments attract visitors who prefer local culture to worldwide style. Conserving historic fabric and urban history may generate cash by preserving the environment and meeting visitors' requirements for services and amenities. Tourists should never overcrowd historic districts because it destroys the feeling of place that draws them. Effective urban management and planning are necessary for the tourist business in historic environments.

A sustainable approach to urban heritage conservation considers the link between the historic and natural environments and economic and social challenges. Specific activities or interesting historic, cultural, architectural, landscape or streetscape aspects may create this atmosphere. Ensure beautiful locations with strong identity and place are preserved, conserved and enhanced. Areas could be upgraded as needed to increase the feeling of identity and place.

Urban design and heritage preservation are necessary for sustainable city growth and cultural, historical and architectural legacy preservation. Urban planners and politicians may use these strategies:

a. Conduct a detailed inventory and mapping of legacy assets, including buildings, sites, landscapes and cultural practices. This will identify important historical resources and guide urban design to safeguard and incorporate them.

b. Integrate historical preservation objectives, rules and incentives into urban design policies and laws. Zoning, design and historical conservation incentives like tax credits and grants may be included.

c. Plan new construction and infrastructure projects with heritage effect evaluations. Heritage resource assessments recommend mitigation actions to reduce negative impacts and promote adaptive reuse and repair of historic structures.

d. Balance historical conservation with urban development demands. Guidelines should address building size, materials, façade preservation and suitable new development in historic districts or sensitive historical regions.

e. Involve local communities, heritage advocates and stakeholders in planning to identify cultural preservation values, concerns and priorities. Work together in seminars, public forums and consultations to promote heritage projects.

f. Encourage adaptive reuse and renovation of old buildings for appropriate new uses. Financial incentives, quicker approvals and technical help for property owners and developers encourage adaptive reuse.

g. Protect coherent historic buildings, neighborhoods and landscapes via conservation districts or heritage zones. Preserve these regions' particular character and historical value with strict planning regulations and design requirements.

h. Teach planners, architects, developers and property owners about historical conservation, preservation best practices and sustainable development.

i. Establish heritage preservation monitoring and enforcement procedures. Ensure heritage policies and requirements are followed in planning.

j. Promote city history and historic monuments via cultural tourism. Interpretive signs, historical trails, museums and heritage festivals teach locals and tourists about the

city's history, culture and legacy preservation.

Additionally, design and preservation officials have to be able to maneuver across multiple levels of government since there can be a substantial gap between them in terms of urban transformation and cultural assets on both subnational and supranational planes.

6.   Conclusion

Old streets are among the most intricate urban environments, with designers and architects accommodating many levels and types of users. However, coordinating a site's heritage and cultural attributes is sometimes overlooked. Moreover, as explained earlier, the study tried to Investigate the urban morphology of streets in the historical part of Muharraq city and took sh. Isa Street is a focal point of study as a qualitative study to demonstrate heritage perception by users via appropriate design for the streetscape.

The applied study was conducted on Sheikh Isa Street. Since it is one of Muharraq's important streets and an essential part of its heritage, it was vital to understand the streetscape design to enable the users' senses to perceive its heritage and cultural values.

The study achieved its primary goal of investigating the urban morphology of sh. Isa Street design and streetscape design gives users a sense of heritage value for the areas.

The findings indicate that design intervention is needed to enable a sense of heritage and preserve the site's heritage and cultural values. Streets should be constructed as public spaces where people can easily use them. When the roadway is safe to use, it improves the quality of life, which is essential for human needs.

Consequently, the research achieved its study objectives, illustrating the relationship between streetscape design elements and their role in enhancing the user's sense of heritage as an essential element of urban heritage. Moreover, it proposed a strategy to examine the relationship between the streetscape and its impact on the human sense of heritage in Sheikh Isa Street. Therefore, it answered its questions about how implementing streetscape design will make people perceive a city's heritage.

The findings demonstrated that the constructed environment within the appropriate urban morphology influences people's perceptions of the space. The four vital strategies that came across through the findings must be incorporated to ensure long-term viability. The site has excellent importance; thus, there is a need for proper streetscape implementation that is strategically positioned and has a high pedestrian density. Future research should investigate not only the connection between the streetscape and heritage but also how street design affects the quality of life, given that the street is an essential public area of any country.

7.   Recommendation

Sh. Isa's streetscape should blend old and modern places that meet visitors' bodily experiences and examine their five senses. The Sh. Isa streetscape should contribute to the social, cultural and economic activities. At the same time, it should preserve the traditional essence to cater to a broader range of visitor preferences and residents. The major recommendation of the research is related to:

a. Culture issues: Creating open-air Art galleries: The open-air gallery showcases art from local and emerging artists to showcase traditional and contemporary Bahrain and visitors can explore art galleries' traditional and modern artworks, calligraphy, pottery and other crafts. These open-air galleries provide insight into Bahrain's vibrant art sense.

b. The streetscape should be entirely of live activity, considering the theory of turning space into place. Therefore, the development plan should carefully include an appropriate design for social gathering spaces that helps create a sense of place, brings people together and makes them want to stay longer. That's what makes urban spaces vibrant and exciting.

c. The deployment of the Sh. Isa Street should consider community Engagement by involving local communities in streetscape design.

d. Vibrant and bustling places where visitors can experience the local culture. The traditional market is the ideal place for visitors to shop for souvenirs, handicrafts and traditional textiles. It offers a glimpse into Bahrain's rich heritage and allows interaction with local artisans and vendors. Moreover, visitors can experiment with places by feeling the five senses.

e. "Outdoor and indoor areas" offer a cosy atmosphere where visitors can relax, enjoy and engage in conversations with locals.

f. Visitors can find various traditional restaurants serving traditional Bahraini cuisine and international dishes and the planners can invite attendees to experience impeccable service and a meal they'll never forget through innovative presentation methods.

Vibrant   Outdoor and indoor areas   Visitors
Figure 13. Various traditional restaurants serving traditional Bahraini cuisine

g. The Sh. Isa Streetscape should preserve the area's unique heritage and cultural identity by reflecting the local culture and traditions of the community and maintaining any historical buildings, landmarks or cultural elements significant to the area.

References

Ab Rahman, Z., Thani, S.K. & Roslan, R. (2018). Identifying characters of good street for greater urban quality of life. *Asian Journal of Quality of Life, 4*(15), 19-31.

Addas, A., Alserayhi, G. (2020). Approaches to improve streetscape design in Saudi Arabia. *Current Urban Studies, 8*(2).

Al-Haddad, M., Elghonaimy, I. (2019). Towards reviving the missing noble characteristics of traditional habitual social life: Al-Farej in Kingdom of Bahrain. *Journal of Contemporary Urban Affairs, 3*(2), 35-46. https://doi.org/10.25034/ijcua.2018.4699

Alraouf, A.A. (2014, June). The Rehabilitation of the Muharraq Historical Center - Bahrain: A Critical Narrative. Retrieved 2024, from

https://www.researchgate.net/publication/322330738_The_Rehabilitation_of_the_Muharraq_Historical_Center_-_Bahrain_A_Critical_Narrative

Alsammarae, R. (2018, September 9). Are regional cities designed for people with disabilities? Retrieved May 19, 2024, from https://www.middleeastarchitect.com/insight/40507-are-regional-cities-designed-for-people-with-disabilities

AlSulaiti, A.M. (2009, September). Muharraq City: A GIS-based planning strategy for its ancient. Retrieved 2024, from https://pure.port.ac.uk/ws/portalfiles/portal/5324846/Ch_2_AboutMuharraq.pdf

Amin, A. (2009, June 2). Collective culture and urban public space. https://www.publicspace.org/multimedia/-/post/collective-culture-and-urban-public-space

Baabu, N. 10 things to remember while designing a street. Retrieved May 19, 2024, from https://www.re-thinkingthefuture.com/rtf-fresh-perspectives/a1654-10-things-to-remember-while-designing-a-street/

Bahrain. (2008). Bahrain Economic Vision 2030. Retrieved 2024, from https://www.bahrain.bh/wps/portal/en/!ut/p/z1/lVJNc4IwFPPwrvXDEPAgfoTfqUK0jY8cWlVycgBHoQIJIof33jePJ1q_mlszuvn2bRRStEBWsKzLWFlKwUt1j6qzHM3AMk5gTgiMM_swZzr0AjBHYaHkKAIyDA8B9dRee6RBA9B4-mOHQeLEUPwwBfPI0n74_DwFG-E7-hePfnL9AFNE6LTYoTl2CHdt2dS81TN1KbaZ7GFs6dwhzL

Barnett, J. (1982). *An Introduction to Urban Design*. New York: Harper & Row Publishers.

Beyhan, S.G., Gürkan, Ü.Ç. (2015). Analyzing the relationship between urban identity and urban transformation implementations in historical process: The case of Isparta. *International Journal of Architectural Research, 9*(1), 158-180.

Bhandari, P. (2023, January 9). *Descriptive Statistics. Definitions, Types, Examples*. Retrieved 2024, from https://www.scribbr.co.uk/stats/descriptive-statistics-explained/

Bigdeli Rad, V., Bin Ngah, I. (2013). The role of public spaces in promoting social interactions. *International Journal of Current Engineering and Technology, 3*(1), 184-188.

Britt, K.M. (2009). *Lancaster Renaissance: Urban Revitalization, Heritage Tourism and Community Archaeology*. Columbia University.

Carmona, M. (2021). Contemporary public space, part two: Classification. *Journal of Urban Design, 15*(2), 157-173. https://doi.org/10.1080/13574801003638111

Citygreen. (2020). Specifier Update, 20. Retrieved 2024, from https://citygreen.com/wp-content/uploads/2020/10/CityGreen_Specifier_20-web.pdf

Dubai Culture and Arts Authority. (2021). Directory of services. Retrieved 2024, from https://dubaiculture.gov.ae/-/media/DC/E-Services/Guides/Dubai-Culture-and-Arts-Authority-English-Language-Directory-Of-Services.pdf

Edwards, D., Griffin, T. & Hayllar, B. (2008). Urban tourism research: Developing an agenda. *Annals of Tourism Research, 35*(4), 1032-1052.

El Rashidi, S. (2019). Revitalisation of Muharraq On-site Review Report. https://www.archnet.org/publications/14031

Eldardiry, D.H. (2021, November 21-23). Digitalization and reviving the water frontage following the concept of smart cities after COVID-19 pandemic. *The 4th International Smart Cities Symposium*, 1. https://doi.org/10.1049/icp.2022.0376

Eldardiry, D.H. (2022). An appraisal of the use of courtyard for controlling the spread of Covid-19 in commercial buildings. *New Design Ideas*, Special Issue ICCAUA2022, 62-75. Retrieved Sep 3, 2-24, from http://jomardpublishing.com/UploadFiles/Files/journals/NDI/SI2022/ElDardiryDH.pdf

Eldardiry, D.H. (2023). The modernization of the street vendors services during the Covid-19 pandemic-the food trucks phenomenon. *New Design Ideas, 7*(1), 133–151. Retrieved Sep 2, 2024, from http://jomardpublishing.com/UploadFiles/Files/journals/NDI/V7N1/EldardiryD.pdf

Eldardiry, D.H., Konbr, U. (2022, April). Using Phenomenological theory for sustainable renovation of historical open spaces in Bahrain. *International Journal of Sustainable Development and Planning, 17*(2), 559-568. https://doi.org/10.18280/ijsdp.170221

Elghonaimy, I.H. (2020). Street furniture influence in revitalizing the bahraini identity. *Journal of Contemporary Urban Affairs, 4*(1), 11-20.

Elsayed, H.A., AboWardah, E.S. & Ramadan, M.G. (2019). Traditional market design towards cohesion between social sustainability and bioclimatic approach. In *IOP Conference Series: Materials Science and Engineering, 471*(7), 072002. IOP Publishing.

Evans, G. (2009). Creative cities, creative spaces and urban policy. *Urban Studies, 46*(5-6).

Fadamiro, J.A., Adeniran, A. (2015). Cultural landscapes of the Yoruba of South-Western Nigeria demystified as solidified time in space. *Space and Culture, 19*(1).

Frank, L. (2010, June 25). Streetscape design: Perceptions of Good design and determinants of social interaction. Master's thesis, University of Waterloo. https://uwspace.uwaterloo.ca/handle/10012/5280

Gehl, J. (2003). *Life Between Buildings*. Washington, DC: Island Press.

Gehl, J., Kaefer, L.J. & Reigstad, S. (2006). Close encounters with buildings. *Urban Design International*, 11, 29–47.

Gill, M.J. (2020). Phenomenology as qualitative methodology. In Q*ualitative Analysis: Eight approaches*, 73-94. Sage.

Hamouche, M.B. (2004). The changing morphology of the gulf cities in the age of globalisation: The case of Bahrain. *Habitat International, 28*(4), 521-540.

Hartanti, N.B. (2014, May). Maintaining the urban identity by managing streetscapes character of Bogor city. Retrieved 2024, from https://www.researchgate.net/publication/317176368_Maintaining_The_Urban_Identity_By_Managing_Streetscapes_Character_Of_Bogor_City

Hassan, M. (2024, March 25). *Qualitative Research – Methods, Analysis Types and Guide*. Retrieved 2024, from https://researchmethod.net/qualitative-research/

Holland, C., Clark, A., Jeanne, K. & Peace, S.M. (2007, April 24). Social interactions in urban public places. Retrieved 2024, from https://www.jrf.org.uk/social-interactions-in-urban-public-places

Hołuj, D. (2017). Public spaces and cultural heritage in community projects – the example of Warsaw. *European Spatial Research and Policy, 24*(2), 127–144.

Hunter, M. (2009, October). Changing world, changing views of heritage: The impact of global climate change on cultural heritage. Retrieved 2024, from https://www.researchgate.net/publication/325479232_Changing_World_Changing_Views_of_Heritage_The_Impact_of_Global_Climate_Change_on_Cultural_Heritage

Husain, W.S., Moosa, S., Babili, Z.K., Elghonaimy, I., Al-Madani, W. & Alanzi, N. (2022). Increasing the efficiency of the renovation projects in the heritage areas via using the smart devices, case of the pearling path, Al-Muharraq, Bahrain. *6th Smart Cities Symposium*, 120-125. Bahrain. https://doi.org/10.1049/icp.2023.0359

Husserl, E. (2012). *Ideas: General Introduction to Pure Phenomenology*. London: Routledge.

Imam, A., Helmi, M., Alkadi, A. & Hegazy, I. (2023). Exploring the quality of open public spaces in historic Jeddah. *ACE: Architecture, City and Environment, 18*(52).

Jacobs, A.B. (1993). *Great Streets*. MIT Press.

Job, S., Elghonaimy, I. (2022). Experiencing public parks through phenomenology: Case of Riffa Walk Park, Bahrain. *Civil Engineering and Architecture, 10*(1), 224-235. https://dx.doi.org/10.13189/cea.2022.100119

Johansson, M. (2024). *Importance of Implementing Sustainable Streetscapes in the Local Micro-Geography*. Lund, Sweden: Lund University.

Khalifa, H.E. (2023). Spiritual sensory theory and bodily experiences keys for successful mosque design. *New Design Ideas, 7*(2), 243-264. Retrieved Sep 1, 2024, from http://jomardpublishing.com/UploadFiles/Files/journals/NDI/V7N2/Al-Khalifa.pdf

Koo, J. (2017, August 1). *Streetscapes: Planning and Designing Vibrant Streets*. Retrieved 2024, from https://cedik.ca.uky.edu/community-design/publications/streetscapes-planning

Kozlova, L., Kozlov, V. (2018). Ten quality criteria of the public spaces in a large city. In *MATEC web of Conferences*, 212, 04012. EDP Sciences.

Laing, J. (2011). Sustainable marketing of cultural and heritage tourism. *Journal of Heritage Tourism, 6*(2), 173–174.

Lange, I.S., Rodrigues, C.N. (2021). *Urban Green Spaces: Combining Goals for Sustainability and Placemaking*. Retrieved 2024, from https://www.europenowjournal.org/2021/05/10/urban-green-spaces-combining-goals-for-sustainability-and-placemaking/

Latham, A., Layton, J. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography Compass, 13*(7).

Luu, H.T., Rojas-Arias, J.C. & Laffly, D. (2021). The impacts of urban morphology on housing indoor thermal condition in hoi an city, Vietnam. *Journal of Contemporary Urban Affairs, 5*(2), 183-196. https://doi.org/10.25034/ijcua.2021.v5n2-4

Lynch, K. (1960). *The Image of the City*. Cambridge: MIT Press.

Madanipour, A. (1996). *Design of Urban Space: An Inquiry into a Socio-spatial Process*. Retrieved 2024, from https://www.researchgate.net/publication/31701655_Design_of_Urban_Space_An_Inquiry_into_a_Socio-spatial_Process_A_Madanipour

Mazzola, E.M. (2019). Unsustainable 'sustainable' vs inheritable development. *New Design Ideas, 3*(1), 21-31. http://jomardpublishing.com/UploadFiles/Files/journals/NDI/V3N1/Mazzola%20EM.pdf

Mehta, V., Bosson, J. (2010). Third places and the social life of streets. *Environment and Behavior, 42*(6), 779-805.

Mohamed, A.A. (2023). Urban street imageability in Manama Old Town, Bahrain. *International Architectural Sciences and Applications Symposium*, 1-12.

Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. *Journal of Urban Design, 3*(1), 93-116.

Nia, H.A., Suleiman, Y.H. (2017). Identity in changing context: Factors of losing Identity in new developed part of the city of Famagusta, North Cyprus. *Journal of Contemporary Urban Affairs, 1*(2). https://doi.org/10.25034/ijcua.2017.3644

Nia, H.A., Suleiman, Y.H. (2018, June 1). Aesthetics of space organization: Lessons from traditional European cities. *Journal of Contemporary Urban Affairs, 2*(1), 66–75. https://doi.org/10.25034/ijcua.2018.3659

Olubi, A.R., Aseyan, B.S. (2022). Cultural streetscape: Its value-system, space and significance in Oyo Town, Nigeria. *Advances in Social Sciences Research Journal, 9*(12), 465-474.

Ordoñez, A. (2023). *Student Works*. College of Leadership & Public Service, Lipscomb University.

Rawat, A.S. (2021, March 31). An overview of descriptive analysis. Retrieved 2024, from https://www.analyticssteps.com/blogs/overview-descriptive-analysis

Samadi, Z.H., Hasbullah, M.N. (2008). The enhancement of spaces in between buildings as urban recreation development. *ECER Regional Conference,* 429-440.

Shi, H., Yu, L., Xu, Y., Liu, Y. & Zhao, M. (2023). The impact of the streetscape built environment on recreation satisfaction: A case study of Guangzhou. *Journal of Transport Geography*, 112.

Stauskis, G., Eckardt, F. (2011). Empowering public spaces as catalysers of social interactions in urban communities. *Town Planning and Architecture, 35*(2), 117-128.

Talen, E. (2016). The social goals of new urbanism. *Housing Policy Debate, 13*(1), 165-188.

Tenny, S., Brannan, J.M. & Brannan, G.D. (2022). *Qualitative Study*. Treasure Island, FL: StatPearls Publishing.

Ukabi, E.B., Akçay, A. Ö. (2023). Localization of new design principles in historic environments for sustainable conservation to curb forgery design expressions. *New Design Ideas*, 7, 476-497.
http://jomardpublishing.com/UploadFiles/Files/journals/NDI/SI2023/Ukabi_Akcay.pdf

Urban Design Lab. (2023, May 11). 7 C's of Urban Design. https://urbandesignlab.in/7-cs-of-urban-design

Venerandi, A., Smith, N.B. & Toms, K. (2018). What kind of neighbourhoods will people pay more for? *New Design Ideas,* 2(2), 62-75.
http://jomardpublishing.com/UploadFiles/Files/journals/NDI/V2N2/Alessandro%20Venerandi%20et%20al.pdf

Wibisono, B. H. (2001). Transformation of Jalan Malioboro, Yogyakarta: The morphology and dynamics of a Javanese Street. Doctoral dissertation, University of Melbourne, Department of Architecture, Building and Planning.

Yunus, R.M., Samadi, Z. & Omar, D. (2015). Making of 'Great heritage street'. *Procedia-Social and Behavioral Sciences*, 168, 365-372.