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Case Study

Assessing the Urban Design Features of Historical Street

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Abstract: This study offers a comprehensive and critical evaluation of the urban design elements of Goran Street, a central and historically significant artery in Sulaimani, located in the Kurdistan Region. The research focuses on four primary areas: the street's physical characteristics, spatial organization, the utilization of open spaces, and its ability to meet user needs. Employing a mixed-methods approach—including field measurements, photographic documentation, on-site observations, and user questionnaires—the study reveals several critical deficiencies in urban design quality. Physically, Goran Street suffers from inconsistent building heights and architectural styles, leading to visual disunity. The chaotic use of building materials and color palettes further contributes to an aesthetically jarring environment. Pedestrian pathways are poorly maintained, with inadequate paving, signage, and street furniture, making the area less inviting for foot traffic. User-centered analysis reveals that Goran Street meets only 40.8% of the surveyed expectations related to accessibility, personal safety, and the availability of public services. Despite this, the frequency of open space usage remains high, with 75% of respondents indicating regular engagement, primarily due to the street's central location, though the quality of these open spaces scores a concerning 0%. Additionally, the lack of cultural infrastructure, such as galleries, museums, or performance spaces, limits the street's potential to serve as a cultural and tourism hub. The study concludes by calling for strategic interventions to enhance Goran Street's urban appeal. Recommendations include improving walkability, redesigning public spaces, integrating cultural identity, and enforcing planning regulations to foster a vibrant, inclusive, and historically enriched urban environment.

1. Introduction

Urban design features are the components that shape the form and character of cities and towns, within their structure and design [1]. These attributes critically influence the overall experiences and interactions of individuals within the built environment [2]. Many keys assess urban design features such as: public spaces [3], streets and sidewalks [4], design of buildings [5], land use, transportation systems [6], landscape and green spaces, street lighting [7], cultural heritage features [8], infrastructure services, and sustainable environment [9]. These key features will help residents feel comfortable and enjoy living in the space [7].

Public spaces such as streets are designed and contain different activities where people can engage in walking, shopping, gatherings, and meetings; these activities are essential aspects of urban life [4, 10]. These spaces are also classified as key components of public spaces of any town and contribute significantly to its composition and problems. The aesthetic value of the spatial design elements,

especially in the center of cities, is essential for visitors and tourists, enhancing the development of the urban environment [11].

In contrast to the sustainable redevelopment of European city centers, in developing regions or countries like the Kurdistan Region and the rest of Iraq, the reverse is true; there seems to be no incorporation of pedestrian-friendly urban design elements in the redevelopment of city centers [4]. In everyday activities, like other streets, the city center has great significance as a historic site for visitors and other people who live in the city [4]. The urban design elements play an essential role in attracting both domestic and international tourists and visitors [12].

The streets in the city center of Sulaimani are notably deficient in key urban design elements, which limits their functionality, accessibility, and visual coherence. To address these challenges, the present study undertakes a systematic evaluation of Goran Street—one of the six main thoroughfares in the city's central area and a key component of its urban fabric. Evaluation and quantification of the current condition of urban design features along this historically and functionally significant street has not been addressed previously' therefore, this research aims to fill this gap, with emphasis on open space quality, spatial structure, and patterns of use by examining how users engage with different parts of the street.

2. Related Works

2.1. Historical Street

Streets represent a fundamental component of public spaces, shaped and designed carefully to balance both vehicular traffic and pedestrian movement [13]. The design of streets is frequently influenced by the presence of surrounding structures, enabling their associated requirements to be readily accommodated [14]. Apart from being an infrastructural aspect that facilitates the movement of people and goods, streets act as areas of economic [15], residential, and in general, social interaction [16, 17]. The sizes, configurations, and functions of these streets often vary greatly, with some featuring extended and bustling roadways, while others consist of shorter, quieter passageways [18]. In addition, streets are often active and adaptive, useful for many purposes, and they are important for the city both functionally and economically [15, 18].

Historic streets are city roads inclusive of unique cultural, architectural, and historical aspects, because of a certain event, distinct periods, or transformative developments within a city or region [17]. These streets not only serve as physical markers of historical processes but are also celebrated and often meticulously preserved for the role they play in mapping the historical trajectory of a particular locale [17]. The memory of the past is encoded in these streets as well [17, 19], enabling the understanding of such features as building types, planning concepts, styles, and economic conditions at different times [19].

Historic streets possess diverse values. In the built environment, one is likely to encounter buildings from various historical or stylistic periods along these streets [17, 19]. These streets also have rich value because they are places that enable present-day users or tourists to relate to the past, and in many instances are even the place where important events in the civilizational development of peoples took place [17, 20]. Moreover, historical roads are also important from the perspective of the history of the city; they demonstrate the process of organizational development, expansion, and changes in cities and towns [17, 20].

These streets have a high degree of preservation tourism potential and their maintenance as well as authenticity preservation is in demand as part of broader heritage management strategies because their unique historical and cultural significance often draws tourists, researchers, and historians specifically, thus keeping participation in the local economy and the global tourism market in a lively context [4]. Addressing these concerns, the preservation of culture within historic streets is crucial, as both tangible and intangible heritage associated with these spaces is maintained for posterity [21]. Interventions in conservation must face contemporary concerns without compromising the historical character of the focused areas [21].

Despite their historical, architectural, and cultural significance [17], many historic streets face challenges in meeting the experiential and functional standards of modern urban design [21]. Issues such as outdated infrastructure [20], limited public spaces [22], and weak integration into the broader urban context often hinder user interaction and accessibility [23]. These constraints impact the quality and structure of open spaces, the patterns of use, and ultimately the user experience, making it essential to assess how such streets can support livability, sustainability, and meaningful spatial engagement in contemporary urban environments [24].

2.2. Urban Design Features Quality and Historical Street Perception

The quality of urban design features plays a pivotal role in shaping the physical, visual, and functional dynamics of cities, directly influencing how individuals perceive, navigate, and interact within urban environments [22]. Elements such as the design and connectivity of street networks, sidewalks, transportation systems, and open spaces are essential for promoting mobility, accessibility, and social interaction [24-26]. These components not only support the functional performance of cities but also contribute to their aesthetic value and cultural identity through the strategic placement of buildings, zoning practices, and the integration of public art, monuments, and cultural symbols [27, 28].

In addition, safety and sustainability, as core principles of urban design, are addressed through the use of appropriate lighting, visibility measures, and environmentally responsive elements that encourage walkability and reduced ecological impact [9, 23]. Within this framework, the public realm becomes a vital sphere where sensorial quality, spatial experience, and emotional well-being intersect, creating "pleasure places" that foster community connection and psychological comfort [29].

Crucially, the perception and use of public space depend not only on physical qualities but also on how these spaces support varied human activities. Gehl [3] identifies three main types of outdoor activities: necessary, optional, and social. Necessary activities respond to basic needs and environmental conditions (e.g., shelter or shade), while optional activities are leisure-based and contingent on the space's comfort and attractiveness. Social activities, in contrast, involve interpersonal interaction and community building. Gehl's work demonstrates that poorly designed public spaces tend to accommodate only necessary activities, whereas well-designed environments encourage all three types, enhancing usability and urban vibrancy.

This connection between design quality and user behavior is exemplified by internationally celebrated streets such as Oxford Street in London [30], where thoughtful urban design supports a full spectrum of activity types, enhancing their global appeal. This conceptual foundation provides a valuable lens for examining historic streets, which can similarly contribute to contemporary urban vitality, cultural expression, and a diverse user experience when carefully preserved and integrated.

2.3. Assessing Urban Design Features in Streets

Public areas—such as streets, green belts, parks, squares, and markets—are essential components of urban life, serving as platforms for social interaction, mobility, and community engagement [22]. The definition of public space varies across scholarly literature, reflecting a range of perspectives; however, a common foundation in both the creation and evaluation of such spaces is the recognition of users' needs [23]. Silverman [24] broadly categorizes these needs into dimensions such as comfort, relaxation, passive and active engagement, discovery, and enjoyment—aspects that directly influence how public spaces are perceived and utilized. In alignment with this, the Project for Public Spaces identifies four key components of successful public spaces: access and linkage, comfort and image, uses and activities, and sociability [25]. Similarly, Gehl [3] emphasizes that public spaces should not only fulfill their intended functions but must also remain safe, accessible, and comfortable for diverse groups of users.

While addressing individual needs is critical, the quality of open spaces and their spatial organization are equally significant in shaping user experience. The spatial structure of open space, particularly the distribution of buildings and pathways, directly influences movement patterns, behavioral tendencies, and opportunities for social interaction [26]. Moreover, the use pattern of open

space is shaped by both the types of activities it accommodates and its environmental appeal, which together affect how people perceive, appropriate, and emotionally connect with the space [27-29]. In essence, the spatial layout, the design attributes, and the alignment with user needs collectively determine the success of public open spaces in fulfilling social, cultural, and functional objectives.

In this study, we adopted and adapted the analytical framework proposed by Abbasi *et al*. [27] (Figure 1), incorporating additional sub-factors to reflect the local context of Goran Street in Sulaimani. This framework was employed to assess key aspects of the street's urban design quality, including open space quality, spatial structure, and use patterns, in direct relation to the needs and behaviors of its users. To conduct a comprehensive evaluation, we utilized a mixed-methods approach combining qualitative observations with quantitative data analysis to capture the multifaceted nature of spatial performance.

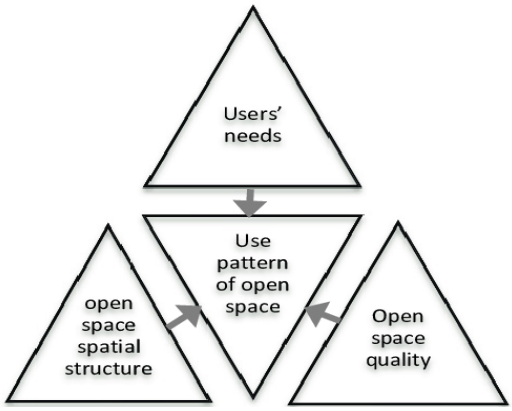


Figure 1: Framework for evaluating the aspects of urban design features [27].

2.3.1. Case Study

Sulaimani, located in the southern part of the Kurdistan Region of Iraq, is a metropolitan city of notable political, cultural, and economic significance. Often referred to as the "City of Culture," Sulaimani is distinguished by its rich historical background, ethnic diversity, active public life, and a unique mountainous landscape that contributes to its picturesque character. As the second largest city in Iraqi Kurdistan, it serves as a dynamic urban center where historical identity coexists with contemporary urban growth. Within its bustling city center, five primary streets—Sabunkaran, Piramerd, Mawlawy, Kawa, and Goran—form the core of urban connectivity and public activity [4]. Among these, Goran Street stands out as a major historical and cultural corridor, making it a strategic choice for this research. Its central location, accessibility, and high footfall render it ideal for analyzing public space usage and user interaction. Moreover, its blend of pedestrian areas, mixed-use development, and architectural heritage provides a fertile ground for evaluating urban design quality, spatial structure, and open space use patterns. As a microcosm of the broader challenges and opportunities faced by historical streets in evolving cities, Goran Street exemplifies the tension between preservation and modernization, justifying its selection as the focal case study in this investigation.

2.3.2. Historical Context

Goran Street, the name regularly used by Sulaimani residents being Orzdy Bak, was built in the early 1970s, making the street one of the city's oldest and most visually appealing. Since its establishment, it has been an area of great importance in the city of Sulaimani. The street has emotional and cognitive fabric interwoven within it which includes the road's original aim, to serve as a marketplace for women away from the disturbances caused by men. However, According to a long-term resident of Sulaimani, the street was meant to be exclusive for women; at one end of the street, behind a fence, was a place where men watched women shop. Usually, women tend to engage in commerce and activities independently of men, yet the enjoyment and vibrancy of these endeavors have historically been shared within the collective memory of the street's cultural and social fabric.

2.3.3. Location

Goran Street, located in the inner northeast of the city, runs from Rashid Bank to the old house of Rashid Salim Miran and continues until the onset of Ibrahim Pasha Street. It is surrounded by the historical neighborhoods of Sabunkaran, Malkani, Sara, and Ibrahim Pasha. The street measures 470 meters in length and 25 meters in width, therefore making it one of the busiest streets in the city center of Sulaimani, known as Goran Street [1] (Figure 2). The street has a range of activities, wasting no time in drawing more and more people for leisure, turning up for medical appointments, and going to buy basic commodities, which contributes to the retention of its primacy in the city's everyday life.

Goran Street hosts a variety of establishments, such as pharmacies, clinics, restaurants, coffee shops, fast food outlets, tea houses, clothing stores, sports shops, parking facilities, ice cream parlors, bus stations, and bookstores.

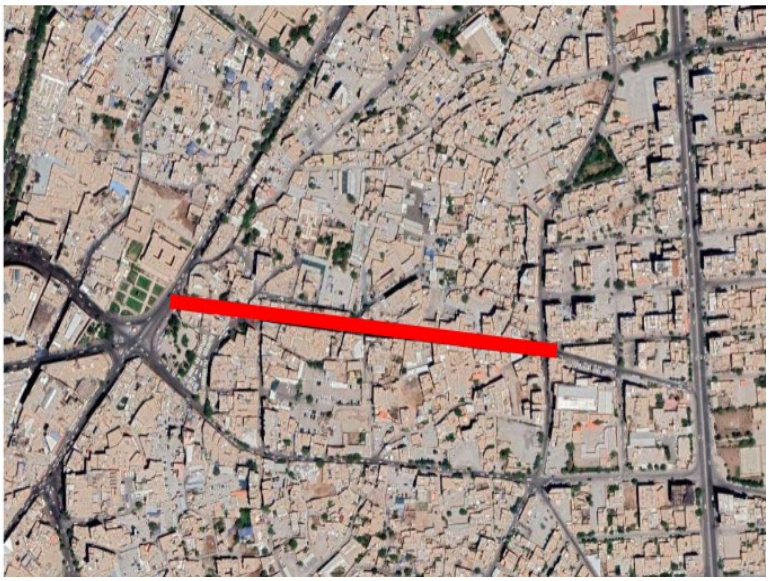


Figure 2: The location of Goran Street according to Google maps.

Like a majority of the streets in both Iraq and Kurdistan, Goran Street is also lacking in urban design elements. The absence of homogeneous building heights and aligned structures, ordering and combining different colors of buildings to produce non-dispersed and non-unified levels with different shapes of architecture, varieties of materials, and street furniture created a cluttered image. This enables a disconnect where the primary concern is not the beauty of the place, but where the place belongs for the people who want to walk around as visitors. In addition, this chaos has a wider effect in a negative manner insofar as security, quality of environment, integrations, and cities in general in the region are concerned. In addition, a situation has also arisen where the sidewalks are taken over by the shops and the markets for their own interests, resulting in the loss of the walking space. The situation has been aggravated further by the rising overlap of foot traffic and vehicular flow [4].

3. Materials and Methods

As outlined in the literature review, it has been observed that urban design characteristics can be assessed qualitatively as well as quantitatively. The evaluation requires merging objective and subjective data collection and analysis. Due to the scope, focus, and page limitations of this research study, only qualitative and quantitative data regarding user needs (social), open spaces utilization, safety (connectivity, accessibility), and cultural aspects of Goran Street were collected and analyzed. The data collection involved systematic measurements of physical features during fieldwork, making observations, and conducting photographic surveys and questionnaires for all sub-factors. Each of these sub-factors is compared to the local standards. The standards referenced in this study are derived

from official documentation provided by the Municipality of Sulaimani. These regulations include a range of urban design and planning criteria specifically developed for buildings and open spaces located within the city center

Data collection for this study was conducted over five months, spanning from October 2023 to March 2024. In alignment with established recommendations for exploratory research, which suggest an appropriate sample size of 30 to 50 participants [28], this study exceeded the minimum threshold by engaging 100 respondents through an online questionnaire. Most of the participants were experts in the urban design features and characteristics of the street. This broader sample was intentionally selected to ensure diversity in terms of age, gender, socioeconomic background, and geographic location, thereby enhancing the representativeness and reliability of the findings.

3.1. Data Collection

3.1.1. Measurement of Physical Features

Toaccurately assess the physical performance of Goran Street, a comprehensive inventory was conducted, which included the quantity and type of all urban design elements associated with the physical features in the street.This included aspects such as building color, materials, height, and deviations, and accurate measurements of specific elements such as street length, width, height, slope, and gradient.These measurements were performed for each side separately.These data were also digitized to improve clarity for the reader (Figures 3).

Figure 3: The physical dimensions and spatial configuration of Goran Street were accurately measured and digitally represented.

3.1.2. Observation, Facade, and Streetscape Assessment

To undertake this analysis, we documented the skyline and façade streetscape features of both sides of Goran Street through mobile phone and panoramic in the same individual location on the same day, ensuring consistency in lighting and perspective. The images were subsequently edited and merged using Photoshop to create a panoramic representation of the street's skyline. This methodological approach enables documenting changes in the height of buildings, yet to highlight key physical ground such as materials, structures, and texture colors.The panoramic aerial technique has been widely used in urban research to visualize diverse architecture and to provide comprehensive views of the urban fabric [2]. This approach not only offers an effective means of documenting the

spatial and aesthetic dimensions of the street but also allows for a detailed analysis of the built environment's character and its contribution to the urban landscape (Figures 4 and 5).

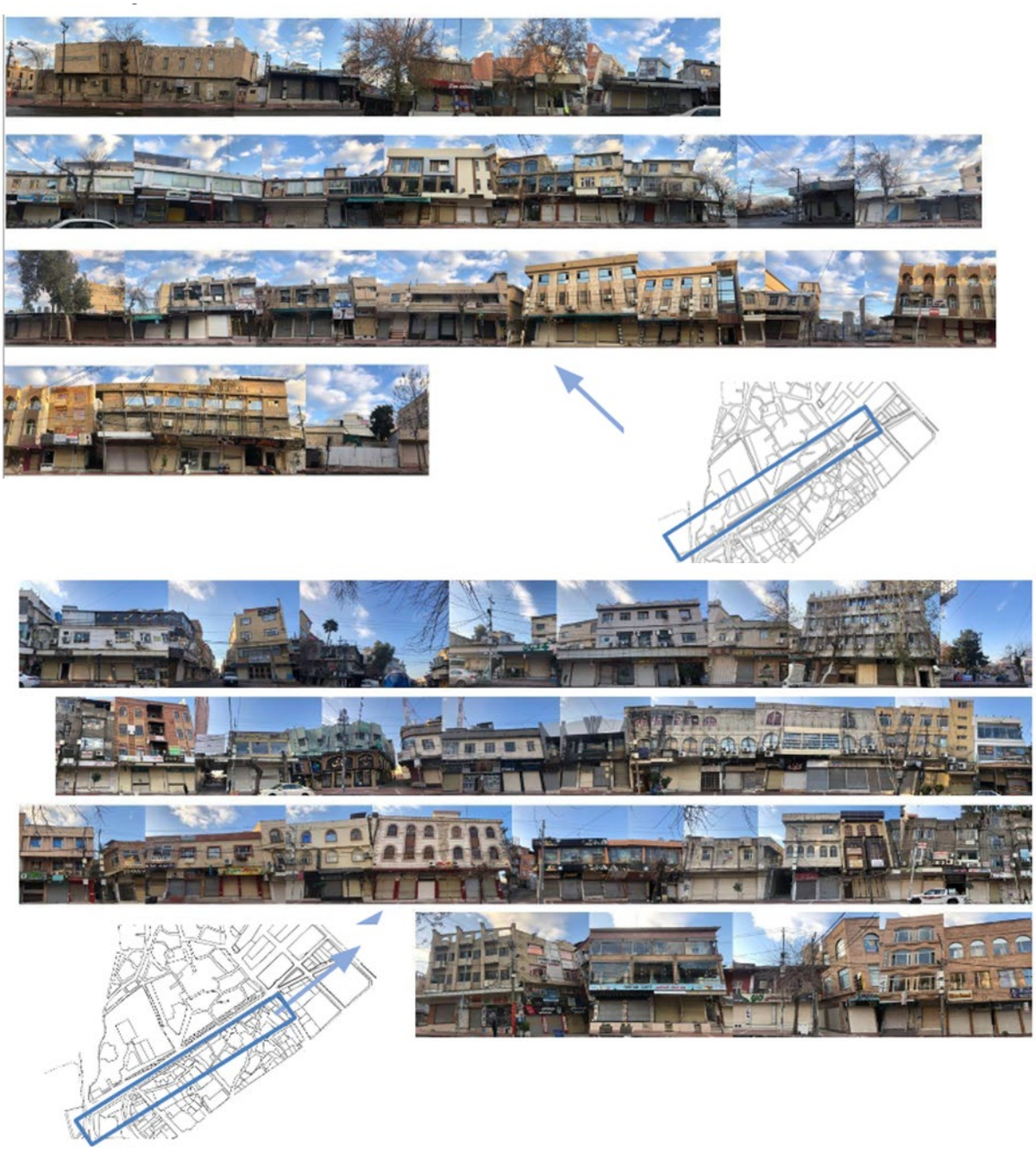


Figure 4: The skyline of both sides of Goran Street.

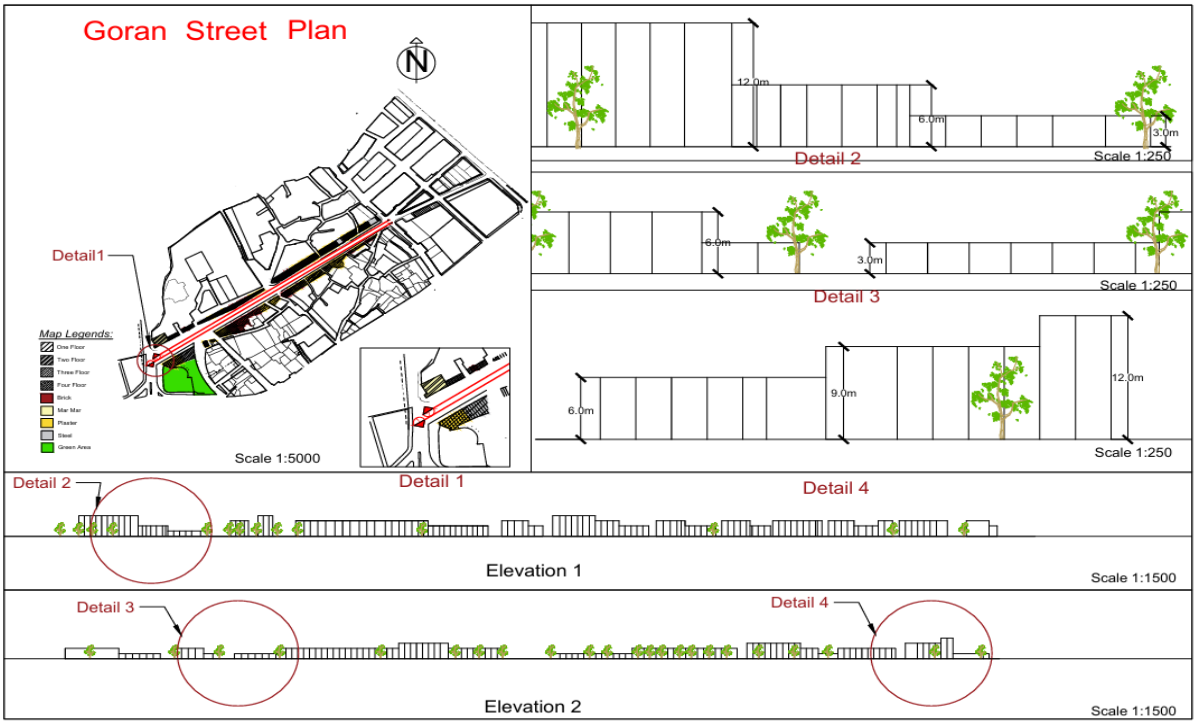


Figure 5: Digitizing the skyline of both sides of Goran Street to make it clearer.

The inconsistency of building heights along streets contributes significantly to visual inconsistencies, destroying a unified streetscape aesthetic and resulting in what is commonly known as visual pollution. This lack of spatial cohesion creates a fragmented skyline, which reduces public funding and the spatial cohesion of the urban environment. In addition, extensive and irregular testing of building materials makes this issue worse. The juxtaposition of different textures, colors, and finishes creates a chaotic and cluttered appearance, which reduces the visual quality and legibility of the streetscape. These factors are working together on the quality of urban spaces, disrupting their functionality and the overall experience for residents and visitors alike.

4. Results

Qualitative and quantitative analysis, together with observations of Goran Street in the center of Sulaimani, reveal significant deficiencies in urban design characteristics across various aspects and factors. Height, materials, deviation, color, and furniture height negatively affected the overall quality of the pavement. According to local standards (international images and pedestrian survey data), the comparisons are as follows (Figure 6).

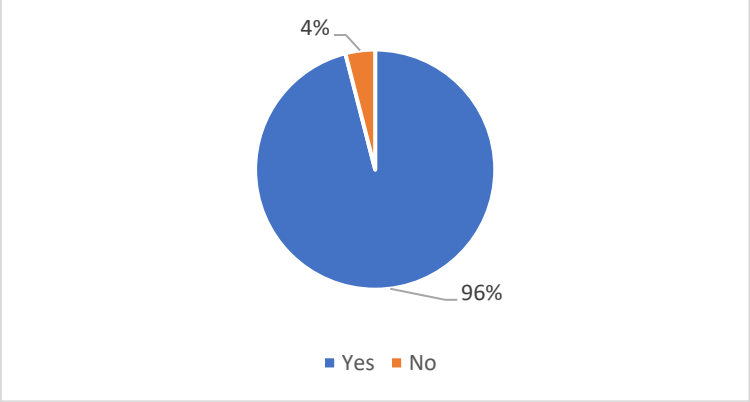


Figure 6: The percentage of visitors to Goran Street.

The data presented in the chart indicate that 96% of the respondents visited Cultural Street. This finding suggests a high visitation rate among both residents and visitors from outside Sulaimani.

4.1. User's Need

Based on a questionnaire conducted with pedestrians in the city center, several requirements were identified that could enhance visitors' quality of life and enjoyment while visiting Goran Street. These needs were clarified through direct user input, highlighting the importance of conducting surveys to capture users' specific needs. The identified needs of pedestrians are outlined as follows:

4.1.1. Services

According to Gehl [3], the primary and the most essential services provided on major historic streets typically include cafes and restaurants, craft shops, museums, cultural centers, bookstores, public spaces, and street vendors. On Goran Street, many of these services (such as cafes, restaurants, bookstores, and street vendors) are present;However, some services, such as museums and public spaces, are conspicuously absent (Table 1). A questionnaire on Goran Street service reveals that 29% of participants expressed disatisfaction with the services available, while 28% reported satisfaction with the services in this street, with the remainder having a neutral response. This distribution indicates that overall perceptions of service quality in Gorran Street are divided, with both positive and negative evaluations receiving similar levels of support.

Table 1: Summary of main themes of service factor came out from local standards, existing, and questionnaire.

Service factor	Local standards	Existing
Cafe and restaurant	✓	✓
Culture and museum	✓	×
Bookstore	✓	✓
Public space	✓	×
Street vendors	✓	✓

Questionnaire and result: The services are deemed inadequate, as only 29% of participants expressed satisfaction with the services available on the street (Figure 7).

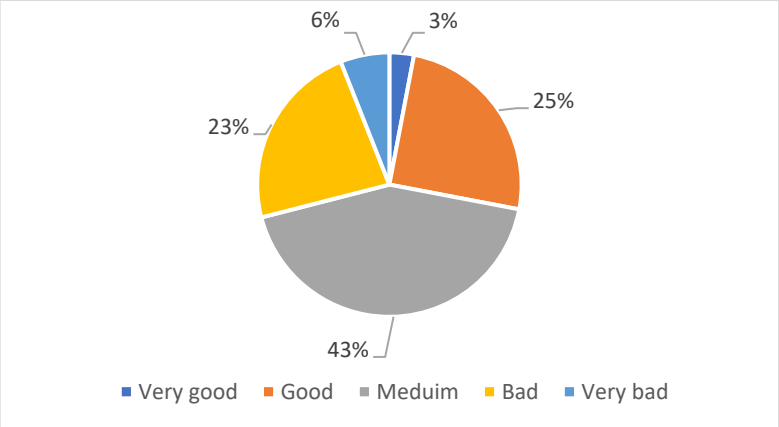


Figure 7: Satisfaction with services in Goran Street.

Percentage of Service Availability= (Number of Available Services /Total Number of Service Factors)×100 = (3/5) ×100= 60%.

The table above presents the total services that is available in the street, which is quantified at 60%, which exceeds the half mark in total. This indicates that the overall quality of available services on the street can be moderately satisfied by participants. Such a ratio illustrates that improving service quality

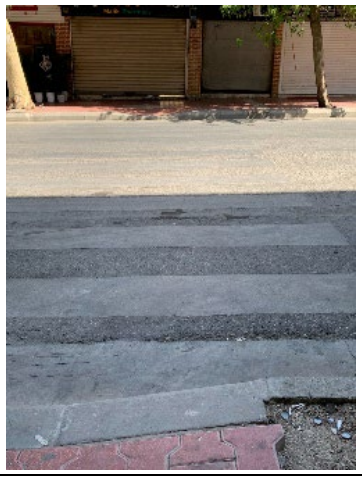
can be easier because the current state of services is functional and provides an appropriate level of accessibility and benefit to users.

4.1.2. Accessibility, Connectivity, and Safety

This section critically examines the concepts of accessibility, connectivity, and safety, along with their associated sub-factors (Table 2).

Table 2: Summary of main themes of accessibility, connectivity, and safety derived from local standards, existing, and questionnaires.

Accessibility factor	**Local standards**	**Existing**
Ramps	✓	✗
Clear signage	✓	✗
Smooth pathway	✓	✓
Questionnaire and results: According to the questionnaire, 42% of participants are satisfied with the height of the sidewalks, attributing this satisfaction to maintenance that was carried out a few years prior (Figure 8)		
Connectivity factor	**Local standards**	**Existing**
Well-defined pathway	✓	✓
Public transportation	✓	✓
Questionnaire and results: Public transportation services are effective due to the designated bus areas. This infrastructure facilitates easy access to the street, enhancing overall accessibility for the public		
Safety factor	**Local standards**	**Existing**
Well-maintained sidewalk	✓	✓
Questionnaire and results: The street features well-maintained pedestrian pathways		
Lighting	✓	✗
Questionnaire and results: A total of 58% of participants expressed dissatisfaction with the street's lighting, particularly noting the absence of adequate illumination during nighttime hours (Figure 9)		
Crosswalks	✓	✓
Questionnaire and results: The street features designated pedestrian crossing areas, which lead participants to express satisfaction with the availability and placement of crosswalks.		



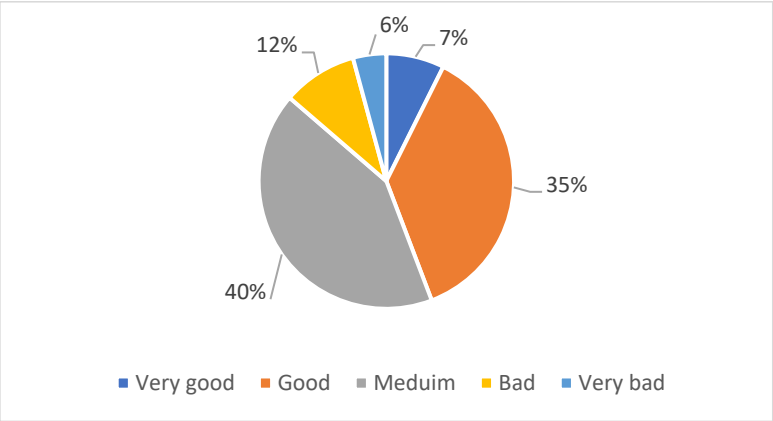


Figure 8: Satisfaction with the height of sidewalks in Goran Street.

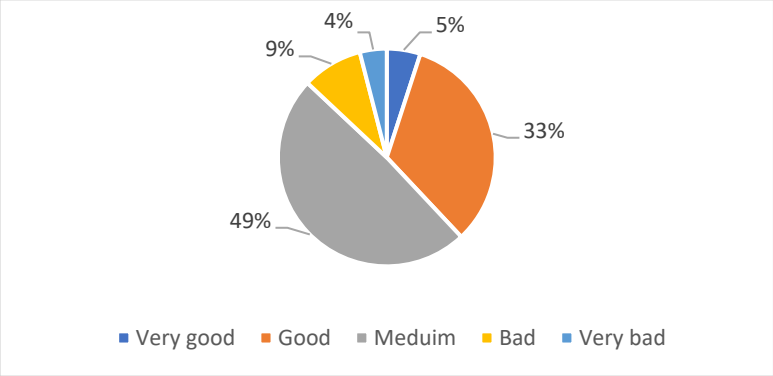


Figure 9: Satisfaction with the lighting of Goran Street at night.

The percentage of accessibility, connectivity, and safety present on the street =(Number of Available Services/Total Number of accessibility, connectivity, and safety factors)×100

= (5/8) ×100= 62.5%

According to the data presented in the table above, the existence of accessibility, connectivity, and safety in the street exceeds 60%, precisely 62.5%. This percentage indicates the high level of this factor in this street, and the street provides all of these factors for users. Such a result reflects positively on the street's design and supports user needs effectively.

4.1.3. Culture Services

Survey results indicate that Goran Street has only one notable cultural building, Mali Sofi Karam, which has been repurposed as a restaurant. Observations show that signage for the site is minimal, and many residents are unaware of its existence

The availability of culture service =(Number of cultural buildings Available/Total Number of cultural factors)×100 = (0/1) ×100= 00%

Cultural factors are absent from the historic Goran Street, despite its importance as a heritage site, whereby it is expected to embody cultural elements that reflect its historical and social significance. However, the lack of cultural infrastructure, such as art, galleries, museums, and other cultural elements, highlights a significant gap in the preservation and promotion of its cultural identity. This absence reduces the street's ability to serve as a center for cultural engagement and heritage representation.

Percentage=(Count for Variable/Total Factors)×100

60+62.5+00/3= 40.8%

The total percentage of user need factors recorded for the street is 40.8%, as indicated by the data. This figure reflects a significant deficiency in addressing the overall needs and expectations of consumers. A percentage below 50% suggests that the street does not adequately meet the basic needs of its users, including aspects such as accessibility, safety, and efficiency. Consequently, this indicates

the need for significant improvements in pavement infrastructure and pavement design to more closely match user demands and enhance overall utility and effectiveness.

4.2. Usea Pattern of Open Space

The term "use pattern of open spaces" refers to the various ways in which open spaces, such as parks, plazas, and recreational areas, are utilized by individuals and communities. This concept encompasses several key aspects (Table 3):

Table 3: Summary of main themes of use patterns of open spaces and its sub-factors derived from local standards, existing, and the questionnaire.

Use a pattern of open spaces	Local standards	Existing
Types of Activities: The different activities that people engage in while using the open space, such as walking, jogging, picnicking, socializing, playing sports, or attending events.	✓	✓ and ✗
Questionnaire and results: Some activities, such as walking, socializing, and participating in events, are accessible on the street; however, others are not available. The types of activities in Goran Street are shops, clinics, restaurants, and other activities.		
Frequency of Use: How often the open space is used by individuals or groups. This can vary based on factors such as location, amenities, and seasonal changes.	✗	✗
Questionnaire and results: There is limited frequency in the variation of activities on the street.		
Time of Use: The specific times of day or year when the open space is most frequently used. For instance, some spaces may be busier during weekends or evenings.	✓	✓
Questionnaire and results: This street becomes particularly busy on various occasions, during weekends, and in the afternoon hours.		
User Demographics: The characteristics of the individuals using the space, including age, gender, socioeconomic status, and cultural background. Different demographic groups may have varying preferences and patterns of use.	✓	✓
Questionnaire and results: The street is utilized by people of all ages and groups, even the disabled, offering a diverse range of activities and uses that cater to all age groups.		
Spatial Distribution: How different areas within the open space are utilized. Some sections may be more popular than others due to amenities, accessibility, or aesthetics.	✓	✓
Questionnaire and results: The street is of historical significance and possesses a rich cultural background, attracting many people who appreciate its aesthetic value. Additionally, it is easily accessible to the public.		
Social Interactions: The ways in which individuals interact with each other in the open space, including the formation of social networks and community connections.	✓	✓
Questionnaire and results: This street facilitates significant social interaction.		

Percentage of use pattern open space =(Number of used patterns/Total Number of use patterns in open spaces)×100 = 4.5/6×100= 75%

The data indicate that 75% of respondents use open spaces. This suggests a high occupancy level in these areas.

4.3. Open Space Spatial Structure

Table 4 provides a detailed analysis of the sub-factors that make upregarding both local and international standards, providing a comparative evaluation. In addition, this table provides an assessment of the current conditions for each sub-factor, pointing out any disparities or alignments with the established benchmarks. The results are documented in detail to facilitate critical insight into

the performance and adequacy of the spatial structure concerning open space planning and design (Table 4).

Table 4: Summary of main themes of open space and spatial structure and its sub-factors derived from local standards, existing, and questionnaires.

Open space spatial structure	local and international standards	Existing
Distribution: The spatial distribution of open spaces and activities on streets greatly impacts accessibility and usability. A well-balanced distribution, especially on key cultural and central streets, is crucial for ensuring equitable access for all residents.	✓	×
Results: Goran Street suffers from unstructured activity distribution, leading to congestion that hinders accessibility, especially for healthcare access. The absence of green spaces, which are essential for public health, air quality, and social cohesion, further impacts the street's livability and limits social interactions. The main public area, Bardarky Saray, is predominantly occupied by vehicles, reducing its pedestrian-friendliness and community value, and ultimately limiting the street's potential as a vibrant, accessible space 		
Functional: The team refers to the roles open spaces serve, such as recreation, social interaction, and ecological functions like storm water management. The spatial structure of these spaces is crucial in determining how effectively these functions are integrated and balanced within the urban environment.	✓	✓
Results: Goran Street supports a variety of recreational and leisure activities, making it a popular spot for both residents and tourists. With numerous restaurants, shops, cafes, and fast-food outlets, the street offers diverse opportunities for social interaction and entertainment. Its functional diversity enhances its role as a vibrant, multifunctional space that meets the recreational and social needs of the community, solidifying its appeal as a key urban destination. the types of activities in Goran Street are: 38% for shopping 10% for eating 13% for enjoying 14% for the clinic 25% for other purposes (Figure 10)		
Integration with Urban Form: Open spaces are essential parts of urban design, influenced by surrounding land uses, transportation, and architecture. When effectively integrated with the city's structure, they improve the city's resilience and enhance residents' quality of life.	✓	×
Results: In the case of Goran Street, however, the distribution of activities and functions appears to be random and lacks a coherent spatial organization. This lack of systematic planning has resulted in poor integration with the surrounding urban form. The street's layout does not align harmoniously with the city's land use patterns or transportation networks, limiting its potential to function as an interconnected and well-organized part of the urban fabric. Consequently, the absence of integration detracts from the street's capacity to contribute meaningfully to the overall urban experience.		

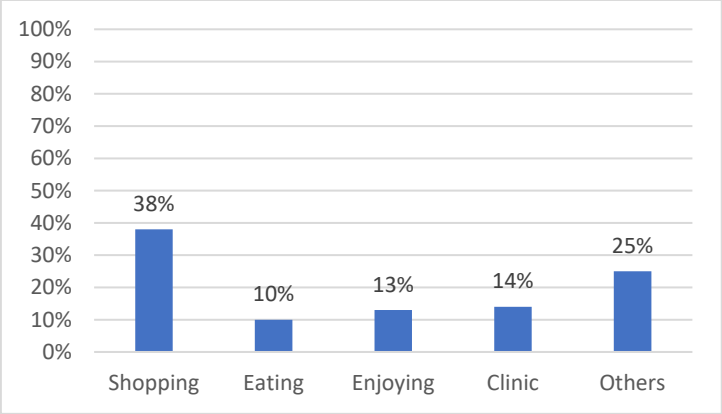


Figure 10: The activities in Goran Street.

Percentage of open space spatial structure =(Number of spatial structure /total number of spatial structure)×100 = 1/3×100= 33%

According to the data in the table above, the total percentage of open space within the urban street structure is 33%, indicating a limited amount of open space available.

4.4. Open Space Quality

The quality of open spaces encompasses several critical elements, including the architectural design of surrounding buildings, the comfort of the environment, pedestrian safety, environmental quality, social interaction, and maintenance practices. Each of these factors is elaborated upon in the context of Goran Street as follows (Table 5):

Table 5: Summary of main themes of open space quality and its sub-factors derived from local standards, existing, and the questionnaire.

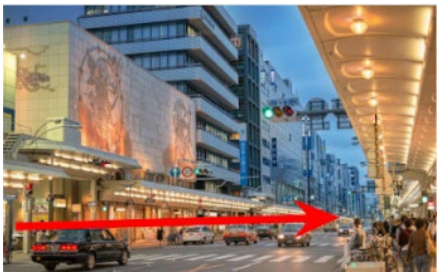
Open space quality	local and international standards	Existing
Building height	>10m 	
Results: Local standards suggest building heights should be under 10 meters (1-3 floors), but actual heights range from 3 to 12 meters, surpassing this limit. This discrepancy has negatively affected visibility design. A pedestrian survey found that 47% of respondents were dissatisfied with the building heights, citing visual pollution caused by the inconsistencies (Figure 11).		
Furniture: Local standards specify that the only street furniture should be trees and lighting.	✓ 	× 

Table 5: Continue

Results: In practice, the sidewalks are often obstructed by various elements, including seating and merchandise from shopkeepers, which extend beyond the trees and lighting fixtures. This congestion has impeded pedestrian flow and compromised pedestrian safety.

Deviation: There is no requirement for setbacks along this street.

0 Deviation



Results: The buildings exhibit setbacks ranging from 0.5 meters to 2 meters. This creates an uneven appearance among the structures and raises safety concerns, particularly for visually impaired individuals who may not perceive the variations in building alignment. (Figure 12)

Color and material of buildings:

The street presents a varied array of colors, some of which originate from natural sources, while others are introduced through modern interventions utilizing contemporary materials.

Red or yellow

brick, stone, local material

Results: The buildings along the street lack a cohesive color and material scheme, resulting in visual pollution. This inconsistency undermines the aesthetic coherence of the area and further diminishes the cultural identity of the street. While 84% of participants agreed that the color plays a significant role in the aesthetic appeal of the city center, 42% of them expressed no concerns regarding the color of the buildings on Goran Street (Figure 13).

Shape and Elevation

Traditional culture shapes

Results: The buildings along this street have experienced a significant loss of their traditional cultural character, particularly in the absence of architectural elements such as "shanashel," which were historically used for windows. These distinctive features, once prevalent, helped to distinguish the local cultural identity of the area from other regions. The current architectural designs, which diverge from these culturally preferred forms, further contribute to the erosion of the street's unique cultural heritage. and 33% of participants do not agree with the shape (Figure 14)

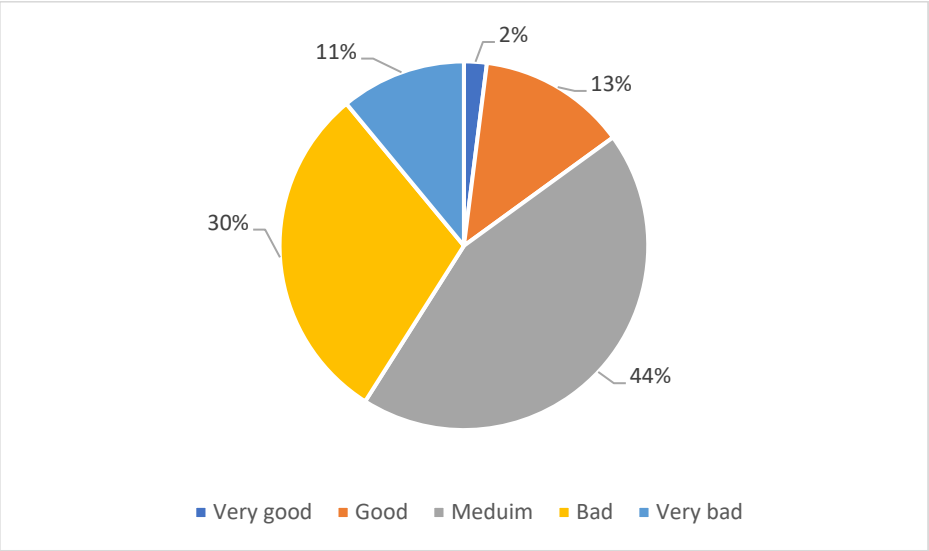


Figure 11: Satisfaction with building height in Goran Street.

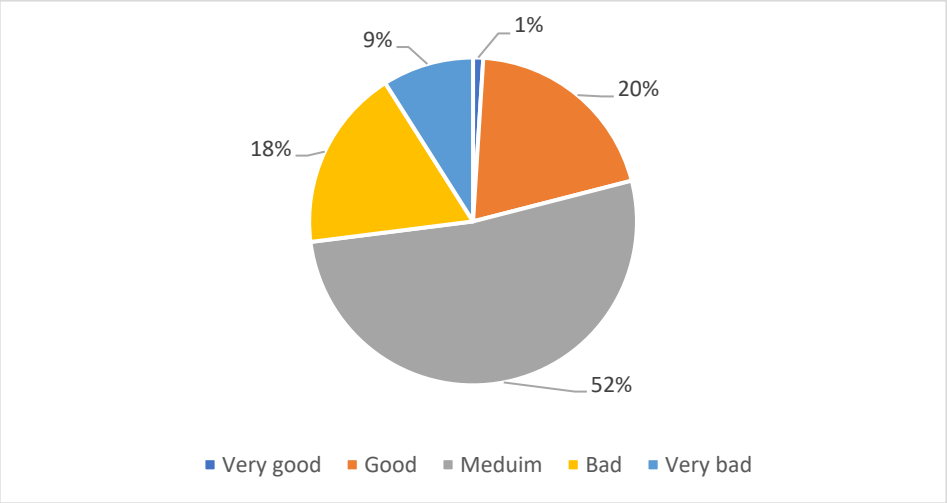


Figure 12: Satisfaction with the sidewalks of Goran Street.

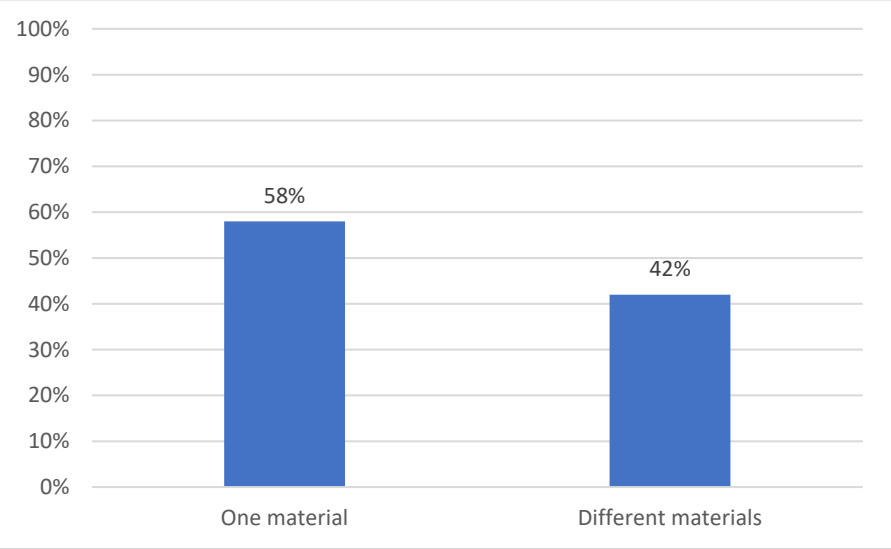


Figure 13: Using materials in the building of Goran Street.

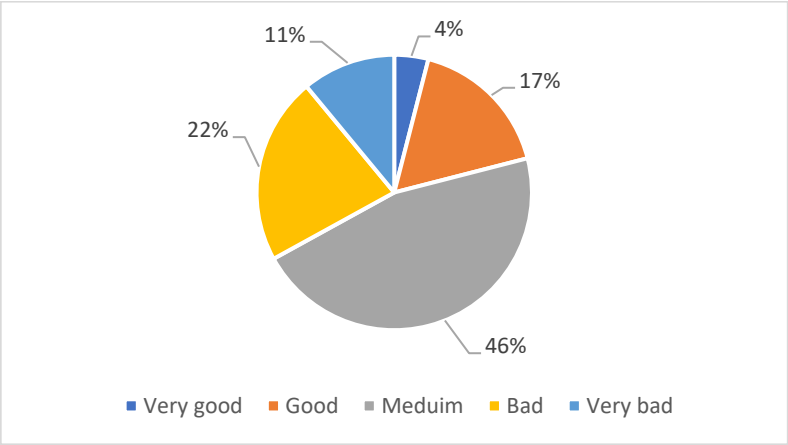


Figure 14: Satisfaction with the shape of the building, Goran Street.

The data indicates that the percentage of quality open spaces is 0%. Additionally, deviations in building height, materials, and street furniture from established standards were observed.

The figure shows that the usage pattern of open spaces on Goran Street is 75%, while user needs are recorded at 40.8%. The spatial structure of open spaces is 33%, and the quality of open spaces is recorded at 0% (Figure 15).

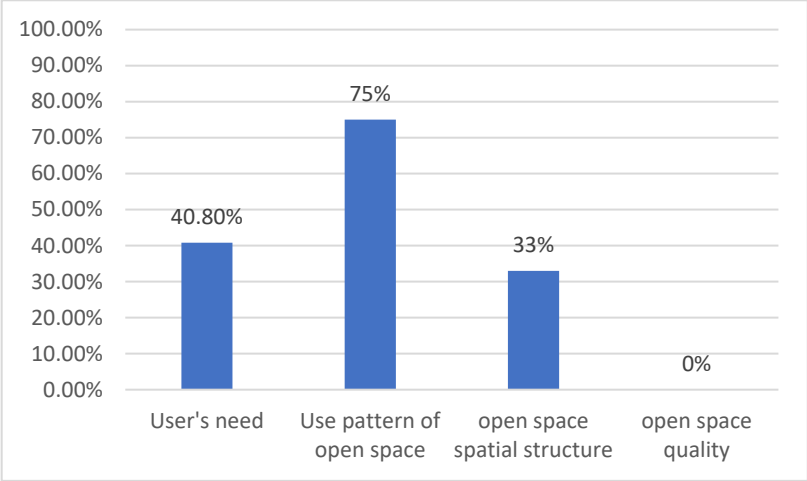


Figure 15: The final chart of the four main factors.

5. Discussion

5.1. User's Need

The findings underscore the pivotal role of Cultural Street as a social and cultural hub within Sulaimani. The exceptionally high visitation rate (96%) reflects its deep integration into daily life and its significance as a space for social interaction, cultural expression, and community cohesion. The street's ability to attract locals and visitors highlights its dual function as a communal gathering space and a cultural tourism landmark. This suggests that Cultural Street reinforces local identity and fosters cross-community engagement, thereby contributing to the city's broader reputation as a center for cultural heritage and urban tourism [4].

Despite its significance, the study reveals certain service limitations on Goran Street that hinder its full potential as a cultural hub. While the presence of cafes, bookstores, and street vendors aligns with the characteristics of historic streets, the absence of key cultural institutions, such as museums and dedicated public spaces, presents a gap in service availability. This shortcoming could impact both local engagement and the street's appeal to tourists seeking immersive cultural experiences [25]. The divided opinions among respondents regarding service quality further highlight the need for targeted

improvements to enhance visitor satisfaction and ensure the street meets the diverse expectations of its users [24]. Addressing these service gaps through the integration of cultural facilities would strengthen Goran Street's role as a vibrant cultural and historical landmark.

Additionally, the findings emphasize the importance of accessibility, connectivity, and safety in enhancing the usability of Goran Street. While existing sidewalks, ramps, and crosswalks facilitate movement, their overall effectiveness depends on proper design and maintenance. Limited accessibility can exclude certain groups, reducing the street's inclusivity. Furthermore, connectivity issues may hinder seamless pedestrian movement, affecting the street's integration with the broader urban fabric. Safety concerns, including inadequate lighting and pedestrian security measures, could deter engagement, ultimately impacting the economic and social vitality of the area. Addressing these issues would enhance Goran Street's role as a dynamic and welcoming urban space.

Lastly, the study highlights the underrepresentation of cultural institutions along Goran Street, despite the recognized importance of preserving heritage in the city center. The limited visibility of Mali Sofi Karam, one of the few cultural sites in the area, further exacerbates this issue. Inadequate signage and advertising reduce its accessibility to both locals and tourists, diminishing its potential as a significant cultural attraction. Enhancing the presence and visibility of cultural sites, along with improved promotion and signage, would strengthen the street's cultural identity and attract a broader audience.

In conclusion, while Cultural Street and Goran Street serve as vital cultural and social spaces in Sulaimani, strategic improvements in service availability, accessibility, connectivity, safety, and heritage preservation are essential. Future urban planning efforts should address these challenges to ensure these streets continue to function as inclusive, engaging, and culturally rich environments that contribute to the city's social and cultural dynamism.

5.2. Use Patterns of Open Space

The data indicate that 75% of users engage with open spaces on Goran Street, demonstrating a high level of activity and occupancy. This suggests that these spaces effectively fulfill their purpose, providing amenities, convenience, and design features that attract public participation. The role of public spaces in improving livability and socialization within the urban environment is therefore evident [3, 30]. The popularity of these spaces highlights their importance in fostering social interactions, leisure activities, and public engagement, making them integral to the urban fabric of Goran Street.

5.3. Open Space Spatial Structure

However, the spatial structure of open spaces presents a challenge, as only 33% of the urban street structure consists of open spaces. This low percentage indicates a significant lack of sufficient open spaces, necessitating focused urban design efforts to incorporate essential components that support social and recreational activities [30]. Without these spaces, the street struggles to function as a multifunctional public space, making it less livable and attractive. The limited availability of open spaces restricts opportunities for community interaction, leisure, and cultural activities, which are essential for creating a dynamic and engaging urban environment. To address this issue, urban planning strategies should prioritize expanding and enhancing open spaces to accommodate the growing needs of residents and visitors.

5.4. Open Space Quality

The quality of open spaces on Goran Street is also a pressing concern, with data indicating a recorded value of 0%. This lack of quality is likely due to the absence of clear regulations, poor enforcement of building height standards, and nonconformity of street furniture to prescribed design, material, and functionality standards. Furthermore, many buildings along the street deviate from established guidelines regarding color schemes, materials, and architectural forms. These

inconsistencies result in a visually incoherent streetscape, diminishing the aesthetic and functional value of the area.

To date, no portion of the open development spaces meets standard quality indicators [27]. The deficiencies stem from various factors, including unclear regulations, the ineffective application of height standards, and deviations in street furniture design. Additionally, inconsistencies in building form, color, and elevation contribute to a fragmented urban landscape. The lack of standardization negatively affects the overall aesthetics and usability of open spaces, ultimately weakening their ability to serve as high-quality urban environments. Improving the quality of open spaces through better design standards, maintenance, and regulatory enforcement is essential for enhancing the functionality and attractiveness of Goran Street as a thriving urban corridor.

6. Conclusions

This study critically evaluated the urban design of Goran Street in Sulaimani, revealing major deficiencies in functionality, aesthetics, and cultural identity. The street lacks cohesive design, with poor walkability, limited safety, and inadequate pedestrian access. It primarily supports work-related activities, offering little for social or cultural engagement. While open space usage reached 75%, quality scored 0%, reflecting poor spatial organization and failure to meet user needs. The absence of historic buildings and cultural infrastructure further weakens its identity. Issues such as inconsistent building heights, unregulated materials, deteriorated street furniture, and a lack of cultural expression contribute to a fragmented urban environment. These findings highlight the urgent need for a comprehensive urban design strategy focusing on walkability, safety, aesthetics, cultural revitalization, quality open spaces, community participation, clear design standards, and tourism development.

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