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**URBAN STREET IMAGEABILITY IN MANAMA OLD TOWN, BAHRAIN**

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**ABSTRACT**

*Urban Design Quality Assessment has been developed as an important approach for the study of urban quality with several criteria and measures. This research used Imageability for the assessment of urban design quality in the streets of old Manama, the capital of the Kingdom of Bahrain. It has been going through many developments that brought many changes to the urban quality of the city. These developments have been mainly concentrated in the northern part of the city giving it a new modern character. Old Manama, on the southern side of the new city, kept its traditional urban structure. There is always a need to study the quality of urban design in such situations to understand the relationship between traditionality and modernity, and continuity and change. The assessment depended mainly on a field survey of some streets with observation and photographing. The photos then were analyzed to explore the quality Imageability through these streets. The research shows that Imageability has distinguished aspects in old Manama but still there is a need for improvement. This research also highlights the subjectivity and inaccuracy of using such criteria and measures for the study of urban character and still there is a lot to be done to improve these criteria and tools.*

**Keywords:** Urban, Quality, Assessment, Imageability, Manama, Bahrain.

**1. INTRODUCTION**

**What is Imageability?**

Human beings are space-time sensitive. People are usually affected by the spatial and temporal settings within which they live. Events and activities through time form history and the spaces where they take place are part of it. Generally, this is the life of people inside their cities. City space is part of life perception and its image affects the way people look at the city. This perceived image is important for connecting people to their city and making them closer to it and feel belonging to it. How much this image is smart, bright, and beautiful, people will feel closer to their city and feel a stronger connection and belonging. Such a distinguished image will remain imprinted in the cognition of people and will not be forgotten. This is one side of Imageability (Cox, 2022).

Imageability is seen by Hasan et al. (2022, p. 5) as “a word that means the physical features of an urban design that define its uniqueness within its environment, a sense of place that permits its inhabitants to define it, and an aspect in determining the quality of space by eliciting powerful, lasting memories. The capacity of any physical thing to elicit a solid image for any particular observer by presenting instrumental and relevant mental pictures or patterns.”

It is the quality of the city that makes it clearly and cleanly loved, respected, and remembered by its people (Meenar et al 2019). It is the distinguishing elements of the city and their amazing characters. It is the urban design sense of these elements and their visual and aesthetical quality that give quality to the built environment (Ernawati, 2021). The image of the city is composed of the different elements of the physical urban structure of the city. Kevin Lurch definition of



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these elements includes districts, nodes, monuments, movement spaces, and landmarks (Lynch, 1960). The level of clarity and simplicity of understanding of these elements and the images they form is the legibility quality of the urban structure of the city. It is also important here to notice that this image not only depends on the quality of the physical environment of the city but also depends on its historical, cultural, and meanings values of society (Jiang, 2012). Imageability therefore is an important quality that is needed to exist in the city to provide comfort, satisfaction, and happiness for the people. These considerations should start from the initial planning stages of the city and its development through the details of its urban design elements including street facades, street furniture, street pavements, and softscape and hardscape elements (Alamouh and Kertesz, 2022). This is in addition to the design of its urban spaces and their contents and the type of activities and functions that they have. Urban design elements and principles play a vital role in the creation of the image of the city. The design of the different elements that compose the urban structure of the city applying order, proportion, rhythm, scale, and other visual design principles is needed. Taking care of the elements of form like color, texture, material, size, and volume is also important. The functions, activities, and overall aesthetical quality of the city and its elements also play a crucial role in the creation of good urban design quality of the city. Imageability makes people feel at home in their city, it is theirs, they know it, feel it, and love it, and within it, they cooperate to take care of it and keep it alive. The image of the city with all its 3 components strengthens the sense of community involvement and belonging (Russell and Sullivan, 2020).

### **Urban street Imageability**

Imageability should be observed in all parts of the urban structure of the city. Streets provide great opportunity for expressing and experiencing the urban qualities of the city including imageability. They are considered the most important open public space in the city. They are where a large amount of livable functions and activities exist such as shopping, entertaining, dining, walking and socializing. (Wan Ismail et al, 2018) argue that streets are important tools for recording and determining the history of the city and its inhabitants and the development of its several structures. The street is not the 2-dimensional space of the pavement where people walk. It is the 3-dimensional space enclosed by the buildings on its 2 sides in addition to the ground plan of the walking pavement. The sky view above is also part of the urban street (Abd Rahman, et al, 2019).

The street as an urban entity has 3 components. First, the tangible part of the physical environment which is composed of the buildings and urban spaces along the street with all their design elements and design principles. These are the main elements that form the visual and aesthetical qualities of the street. Second, the intangible part includes land uses, functions, and activities that exist in the street and give it its social, economic, and cultural identity. Third, there is the perceived image of the street according to the experience of its users and their assessment of its tangible and intangible components. According to this perception, the street will be considered a livable, vibrant, and attractive space that makes its users satisfied and happy. Or it will be considered as an unattractive and unsatisfactory space. As such, the street is a sensitive parameter of the quality of life in the city. It is the vein that circulates the life currents in the city and keeps it alive. Empty streets are nothing but parts of a dead city. (Alamouh and Kertesz, 2022).

Streets strongly connect to the cognitive image people hold for their city. They are the main elements that give form and character to the urban structure of the city. Not only as physical



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spaces but also as functions and activities spaces. People usually give names to their streets according to their functions or activities or relating to cultural, economic, or historical factors, neglecting the names given by the municipality. It is the meaning of the street and the feelings that it generates that are more connected to its value and quality for its people (Cox, 2022).

**2. MATERIAL and METHOD**

**Measuring Urban Street Imageability**

Several studies provided different approaches, methodologies, indicators, and measures for the assessment of Imageability. Since 2005 Reid Ewing and several of his colleagues worked on identifying and measuring urban design qualities in urban streets (Ewing et al., 2005, 2006; Ewing and Handy, 2009; Ewing and Clemente, 2013). The result came with 8 measures for Imageability as they are illustrated in (Table 1). Ernawati (2019) listed 10 indicators that can be used to measure the Imageability of a historic street and its influence on people's preference. In their study for Imageability of the slum area of Mojo Village, Surakarta City, Indonesia Albarqi et al (2022) identified 5 variables, 17 indicators, and 25 measures. They mainly depended on the works of Ewing R. et al. Although the above review is not an extensive one, it shows that the measures of Ewing R. et al are the clearest and simplest ones. They are used in a large number of studies on the assessment of urban design qualities of urban streets. They will be used in this research for the analysis of the urban streets of old Manama.

**Table 1.** Variables, indicators, and measures of imageability

Reference	Urban environment element	Indicators	Measures
Ewing, R et al 2005, 2006, Ewing and Handy, 2009, Ewing and Clemente, 2013).			<ol style="list-style-type: none"> <li>1. The number of courtyards, plazas, and parks on the block face</li> <li>2. Number of major landscape features visible from the block face</li> <li>3. Proportion of historic building frontage (both sides)</li> <li>4. Number of buildings with identifiers (both sides)</li> <li>5. Number of buildings with nonrectangular shapes</li> <li>6. Presence of outdoor dining (observer side)</li> <li>7. Number of people (observer side)</li> <li>8. Noise level</li> </ol>
Ernawati, J. 2019.		<ol style="list-style-type: none"> <li>1. Pleasantness</li> <li>2. Clarity</li> <li>3. Impressiveness,</li> <li>4. Remembrance of the past</li> <li>5. Unforgettable memory</li> <li>6. Uniqueness</li> <li>7. Attractiveness</li> <li>8. Distinctiveness</li> <li>9. Recognizable quality</li> <li>10. Memorableness.</li> </ol>	



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Albarqi et al 2022	Public Open Spaces	<ol style="list-style-type: none"> <li>1. Courtyard</li> <li>2. Plaza</li> <li>3. Park</li> <li>4. Garden</li> </ol>	<ol style="list-style-type: none"> <li>1. Open space is very active, has a local character, and complete street furniture.</li> <li>2. Active open space has a particular character, complete street furniture.</li> <li>3. The open space is active, does not have a particular character, and the completeness of the street furniture is sufficient.</li> <li>4. Open space is not active, has no character, and minimal street furniture.</li> <li>5. Abandoned open space (not designed), has no character, no street furniture</li> </ol>
	Major landscape features	<ol style="list-style-type: none"> <li>1. Riverbanks</li> <li>2. Embankment</li> <li>3. River bridge</li> </ol>	<ol style="list-style-type: none"> <li>1. Landscape elements are very well designed, and have a local character.</li> <li>2. Landscape elements are well-designed and have a specific character.</li> <li>3. Landscape elements are handled quite well but lack a specific character.</li> <li>4. Landscape elements are not well managed, and have no character</li> <li>5. Abandoned (not designed) landscape elements, characterless</li> </ol>
	Outdoor dining	<ol style="list-style-type: none"> <li>1. Food stalls</li> <li>2. Angkringan</li> <li>3. Cafe</li> </ol>	<ol style="list-style-type: none"> <li>1. The food stall has a local character, neat and well-maintained.</li> <li>2. The food stall has a particular character, is neat and well-maintained.</li> <li>3. The food stall does not have a specific character but is neat and well-maintained.</li> <li>4. The food stall has no character; it is neat but not maintained.</li> <li>5. The food stall has no character, is untidy and unkempt</li> </ol>
	Buildings with non- rectangular silhouettes	<ol style="list-style-type: none"> <li>1. Buildings with trapezoid silhouettes</li> <li>2. Buildings with triangle silhouettes</li> <li>3. Buildings with circular/curve silhouettes</li> </ol>	<ol style="list-style-type: none"> <li>1. Buildings with regular shapes, clear styles, well-maintained buildings, with local characteristics</li> <li>2. Buildings with regular shapes, clear style, well-maintained buildings</li> <li>3. Buildings with regular shapes, clear style but not well maintained.</li> <li>4. Buildings with irregular shapes, unclear style but well-maintained</li> <li>5. Buildings with irregular shapes, unclear style, poorly maintained buildings</li> </ol>
	Buildings with identifiers	<ol style="list-style-type: none"> <li>6. Residential</li> <li>7. Commercial</li> <li>8. Office</li> <li>9. Worship</li> </ol>	<ol style="list-style-type: none"> <li>1. Buildings with permanent signage, distinctive character, clear and neat</li> <li>2. Buildings with permanent signage, clear and tidy</li> <li>3. Buildings with permanent signage, clear but untidy</li> <li>4. Buildings with temporary signage, clear but untidy</li> <li>5. Buildings with temporary signage, unclear and untidy</li> </ol>

**Area of the study**

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The study area is in Manama, the capital of the Kingdom of Bahrain, opposite the eastern coast of the Saudi Arabia (Figure 1).



**Figure 1.** Map of the Kingdom of Bahrain. (<https://www.worldatlas.com/maps/bahrain>)

Manama is a vibrant city with a distinguished urban form and structure. This is in addition to its interesting mixture between the old development and the new development in a harmonized and integrated organic structure (Figure 2).



**Figure 2.** Old And New in Manama. (<https://depositphotos.com/photos/manama-bahrain-skyline.html>)

The new spread northwards over reclaimed land and followed postmodern and high-tech architectural styles. The old town remains the hub of busy economic, cultural, and economic life preserving its traditional conservationist style. The streets of the new development are modern, wide, tidy, and car-oriented, while the streets of the old town are narrow, crowded, and pedestrian oriented. Streets of the new development are giant spatial compositions with the high-rise towers enclosing their sides, but the streets of the old town are small to medium size spatial enclosures with low rise and medium rise buildings. Figure 3 shows the boundary of the study area. It is bordered from south and east by Isa Al Kabir av. and Shaikh Mohd Street. From the west there is Al Lolo Road and from the north Government av. in addition to its strategic location, the area are important monuments like Bahrain post building and Bab Al Bahrain at



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Government Av. It has distinguished landmarks like Az-Zamil tower and it has important religious buildings like mosques and Matams.

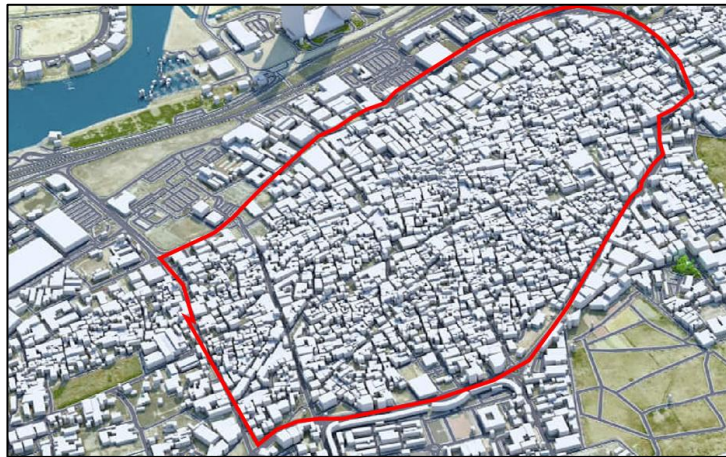


Figure 3. Area of Study in Manama Old Town

(<https://www.renderhub.com/3dstudio/manama-city-bahrain-3d-model-30km>)

### Methodology

This research outlines an Urban Design course exercise that was given to the the students of the Department of architecture, University of Bahrain. The aim was to train the students to link the theoretical concepts, theories, and principles of urban design to the life realities in the urban structure of the city. students were introduced to the concept of measuring urban design qualities in the built environment and the different theories and principles of the subject. For simplicity and practicality of conducting the field study, students were directed to follow the The Illustrated Field Manual for Measuring Urban Design Qualities of Ewing et al (2005). 20 Suitable streets were chosen in the area of study (Figure 4) and each street was given to a group of 4 to 7 students.

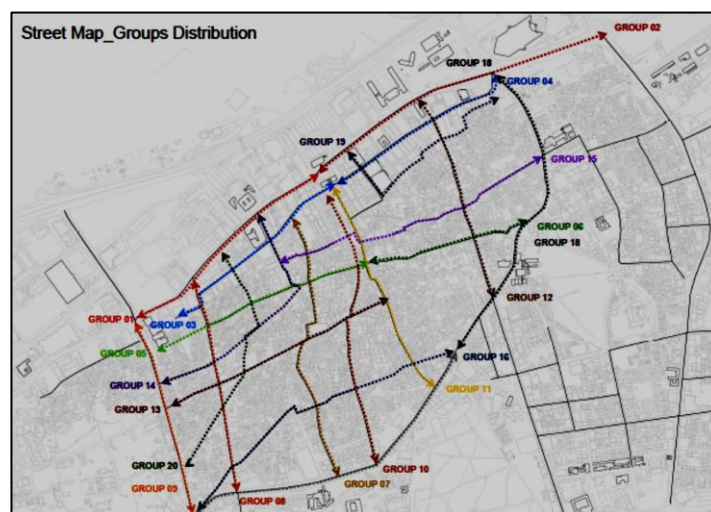
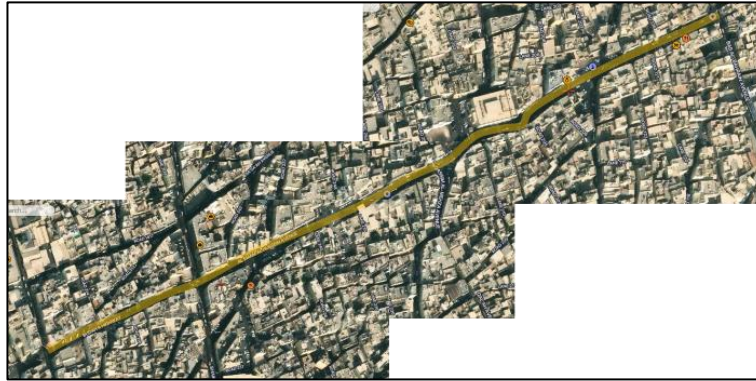


Figure 4. Area of Study in Manama Old Town Showing the Studied Streets.

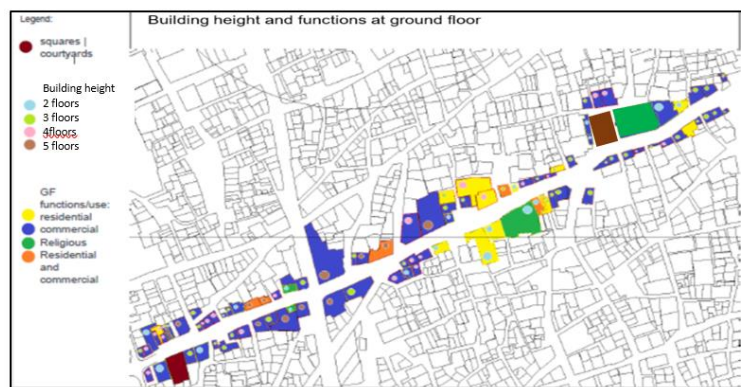
Students visited the streets themselves and documented the urban design qualities of the streets with their impressions. 5 urban design qualities were studied including Imageability which is

considered in this research. Imageability of only street No. 13 is presented in this article. The segment studied starts from its crossing with Bab Al-Bahrain Avenue at east, then passing the grand mosque of Shaikh Ali Bin Khalifa and ends at its crossing with Al-Lulu street at west, (Figure 5).



**Figure 5.** Area of study in Manama Old Town showing the studied streets.

The street is a vibrant urban street open for private car movement. It has a variety of land uses mainly residential in addition to religious like Mosques and Matams. Ground floors are mostly for commercial use. The height of buildings ranges from 2 to 5 floors (Figure 6).



**Figure 6.** Map of The Street With Land Uses and Building Height.

### Imageability Survey of the Street

The analysis depends on the mere assessment by the students themselves. No questionnaires were used for the general public assessment and no expert professionals were consulted as to the original manual of Ewing et al (2005) recommend.

### Courtyards, Squares and Parks

Few little squares scattered along the street the largest and most significant of them are Shaikh Ali bin Khalifa Mosque square (Figure 7) and the squares of Matam Bin Saloom and Matam Bushri (Figure-1). No courtyards or parks exist in the street.



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**Figure 7.** Shaikh Ali bin Khalifa Mosque square



**Figure 7-1.** Matam Bin Saloom and Matam BuShri (last right) squares.

**Major Landscape Features**

The street only has 2 palm tree and few other perennial trees (Figure 8).



**Figure 8.** Palm trees and other perennial trees in the street.

**Proportion of Historic Buildings**

It is believed that many historical buildings exist along the street. Some of them are shown in (Figure 9) depending on subjective judgement of their style and form. To determine their exact number there is a need for careful inspection and referencing.



**Figure 9.** Buildings Believed to Be Historical in the Street.

**Buildings with Identifiers**



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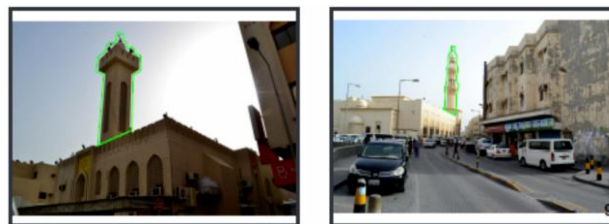
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Generally, all buildings have clear, large and colorful signs since the street is a busy commercial street (Figure 10). Few buildings have special architectural identifiers as part of their form and structure like the minarets of mosques (Figure 10-1).



**Figure 10.** Buildings with to Identifiers.



**Figure 10-1.** Minarets of Mosques as Special Identifiers

**Buildings with Non-Rectangular Shapes**

Non-rectangularity is not common in such traditional quarters. Few buildings have small round corners or small round façade of a staircase. Few other buildings especially mosques and Matams have arched windows in addition to the domes on their roofs (Figure 11).



**Figure 11.** Buildings with round corners and staircases. Far right shows arches on the façade of Matam.

**Outdoor Dining**

The street has many cafeterias and small restaurants but without outdoor dining.

**Pedestrian Count**

The number of people in the street had 4 pedestrian counts at 4 different times Figure. The result is shown in (12 Figure).



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Figure 12. Pedestrian counts in the street.



Figure 12-1. Pedestrians in different parts of the street.

Noise level

Noise was observed without any technology or instruments in the street at different times and places. The results are shown in (Figure 13).

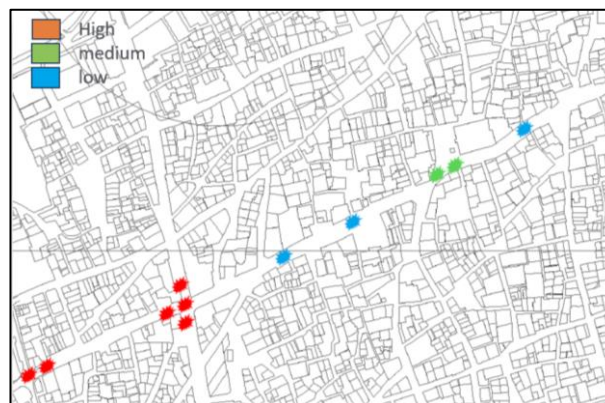


Figure 13. Observation of noise level generally in the street.

Analysis

The survey was a very interesting exercise with the participation of more than 100 students. The many discussions with the students on the routine of the survey and the results brought up these valuable thoughts. The area of study represents the heart of old Manama and the most compact area in terms of its urban structure (Figure 3). It is clear from the aerial photos that the area lacks any sense of real urban space or green structure. The street example considered is in the middle of the area and it has the same problem. The lack of green spaces, courtyards and



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green elements was not the result of ignorance or lack of knowledge. It is the result of many important factors like environmental because of the harsh weather of Manama and the need for compact design to mitigate its effects. There is also the social factor where kinship played a major role in bringing relatives to live close to each other in the same quarter. This is in addition to the economic factor where the early days of Manama did not have much wealth. People have been living with this situation for many years feeling happy and proud of their town. The development of the town faced other problems like the expansion of northward over reclaimed land. This was because of the difficulty of redeveloping the existing areas to the south with their ownership and construction problems.

If the existence of historic buildings is a sign of good urban quality, then the area of study and the street example score very high due to the high historical value they have. Yet this cultural value collides with the need for the rehabilitation of the area. If these valuable buildings are not preserved, they will deteriorate and finally vanish. There is a need to catch up with the pace of the new development. Everybody is happy about the value of historical buildings, but only a careful rehabilitation process can develop the area and transform it into a new age.

Despite most of buildings in the street example having signage identifiers, it was not felt that this is an added urban quality or can much help in terms of Imageability of the street. On the contrary, architectural identifiers like minarets were found to be much more effective in building the special image of the street. On the other side, non-rectangularity of buildings can somehow give them some more recognizable and memorable quality but there is something very important to be noticed here. It is the overall visual design quality and aesthetics of non-regular buildings that give them significance, memorability, and Imageability. There are irregular buildings that are ugly and visually not pleasing. They will not help the image of the street or the area.

Outdoor dining spaces are crucial factors for the vitality and vibrancy of modern urban streets. This is a modern western view related to the western city and culture. Cities of different environmental, economic, and cultural settings should not necessarily be following the same model. The harsh weather conditions in Manama during many months of the year do not encourage outdoor dining. This is in addition to the social and cultural values that also do not encourage such activity. Streets narrow and the commercial functions including food and drink providers are mixed with residential uses. Privacy and social calm constrained the development of outdoor dining facilities in old Manama. The street example considered has no outdoor dining, but it has its many indoor dining spaces that greatly add to its imageability due to their cultural and social values in addition to the special traditional types of food that cannot be found outside the old town.

The pedestrian count concept of western cities cannot be applied to old Manama. Crowded streets of the western city are considered a clear sign of walkability and strong imageability. On the contrary, low pedestrian streets in Manama do not mean they have less urban quality and less attractiveness. It is all about the rhythm of life and the revolution of cultural, social, and economic wheels. At prayers time the example street will get crowded with people going to Mosques and Matams and coming out of them. The same is the case with religious events and festivals. The example street with these activities will draw an effective image more than modern streets outside old Manama. At certain times these crowds make "noise" that is considered lovely and attractive, religious and spiritual. It is not the noise of traffic or machines. Other sounds come from commercial activities are also par of the culture of the area that add to



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its livability and vibrancy. Again, it is the subjective attitude towards urban space and its functions that can affect the formation of its urban image.

### 3. CONCLUSION

The model of Ewing et al (2005) is useful in giving some idea on Imageability but it is subjective, limited, and lacks accuracy in the measures. Ernawati (2019) provided subjective indicators without any idea of how to measure them except through users' questionnaires. AlBaqiri et al (2022) provided more practical details for the measuring of the same indicators of Imageability of Ewing et al (2005). They tried to take into consideration the actual real quality of the physical environment of the street. Still, it needs more development and detailing.

The complexity of the built environment needs careful consideration when it comes to the study and analysis of urban design qualities either the perceived ones like Imageability or the actual qualities of the physical environment and its functions. Therefore, urban streets need more care in considering their urban design qualities. It is crucial to consider the local cultural, social, economic, and political setting active in shaping the built environment and complementing its physical Imageability. This research also gives the opportunity to look at some aspects of the urban design qualities in Manama Old Town and it is hoped that future research will reveal more about these qualities.

#### Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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#### REFERENCES

- Abd Rahman, Z., et.al. (2019). Identifying Characters of Good Street for Greater Urban Quality of Life. *Asian Journal of Quality of Life (AjQoL)*, 4(15) p.19-31.
- Alamouh, S. J. and Kertesz, A. (2022). Street character and current practices influence. *Pollack Periodica*, 17(1), 168–172. DOI: 10.1556/606.2021.00385
- Albarqi, R., Sulistyo, S. and Nareswari, A. (2022). *IOP Conf. Ser.: Earth Environ. Sci.* 1082 012027. DOI 10.1088/1755-1315/1082/1/012027
- Cox, J. (2022). *Defining 'urban character' and its influence on the physical outcomes of cities.* PhD thesis. University of Glasgow. <https://theses.gla.ac.uk/83232/>
- Ernawati, J. (2019). *Imageability of a Historic Street and Its Influence on People Preference.* Proceedings of the International Conference of Heritage & Culture in Integrated Rural-Urban Context (HUNIAN 2019) DOI 10.2991/aer.k.200729.028
- Ernawati, J. (2021). *The Role of Complexity, Coherence, and Imageability on Visual Preference of Urban Street Scenes.* 5th International Conference on Indonesian Architecture and