

## **Walk-ability Potential in The Built Environment of Doha City**

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### **Abstract:**

In order to improve the quality of life, throughout history, humans had been establishing environmentally friendly settlements, which later grew into much larger units, some becoming modern day metropolises. Doha, like many other Islamic cities, grew organically as its population expanded. Due to the exponential growth of population in the State of Qatar, and the fact that majority of its residents live in Doha, walkability and connectivity have become major issues for such fast-growing urban development. Over the last three decades, both research and practice have provided substantial evidence confirming that walkability is essential for improving social integration, enhancing urban quality of life and maintaining physical health. Thus, walking remains the most important form of human transportation.

The purpose of this study is to examine the existing built environment of Doha City and analyze it in terms of its compatibility with the concept of walkability. Following the qualitative survey, aimed at identifying of indicators that can be used when analyzing walkability, it is shown that the planners should go beyond conventional methods, such as beautification and superficial development. The study findings indicate that these aspects can become useful only after thorough analysis of land use patterns, residential density, or transit-oriented development, which are useful tools in the evaluation of the built environment. Ideally, morphological studies focusing on the walkability dimensions, using Kevin Lynch and Jane Jacob's concepts as guidelines, should be conducted. Accordingly, city planners should establish the necessary guidelines for enhancing the public realm, as this would encourage walking and potentially transform Doha into pedestrian-friendly city.

### **Keywords:**

Doha, Walkability, Connectivity, Urban Morphology, Accessibility.

## **1. Introduction**

In the preparation for the Football World Cup 2022, Doha is undergoing extensive development in all domains of the built environment. The entire infrastructure of the city is being developed, incorporating the latest methods and technologies, all in accordance with the highest international standards. The process is akin to a big family house being methodically cleaned, fixed, and refurbished in preparation for a big feast. The 2022 Football World Cup is viewed as an opportunity to redevelop the existing city on solid foundations. Indeed, the city has missed out on several prior opportunities for proper planning due to its rapid and organic, rather than planned and structured growth. It is rare for any city to be given an opportunity to rejuvenate and enhance itself, while expanding at the same time. Therefore, planners and decision-makers responsible for the Doha reconstruction project are looking elsewhere in the world and in different realms for successful examples of establishment or use of norms and standards in city planning. The ultimate goal is to allow Doha to become a city of international stature. This

vision, embodied by QNV's (Qatar National Vision 2030) (General Secretariat for Development Planning 2008) four pillars, is interpreted by QNMP (Qatar National Master Plan 2030) into seven spatial and physical planning principles, namely quality of life for all, sustainability, environmental values, connectivity of people, connectivity of places, economic growth, and diversification. Indeed, achieving sustainability and walkability is one of the main goals of this initiative, as it seeks to improve the quality of life. Qatari people believe that they can do what others perceive as impossible. They are confident that, by integrating global values of the vast international community of foreigners who reside in the state with their local identity and principles, Doha can rise and become a significant city on the world map. Through observation of the existing built environment of Doha and the history of Arab/Islamic cities, it is evident that walkability is an important dimension of everyday life. Despite the harsh climate, people can comfortably enjoy outdoor activities during at least eight months of the year.

Yet, during such a rapid change, errors and omissions may occur. Consequently, akin to the oft-cited butterfly effect, this process of transformation can easily affect the city's morphology in an undesired manner. As a result, the city's walkability, and even its very identity, can be compromised. Public space requires far greater urban design considerations than what has been accorded to this date. Instead of looking at the public space as the leftover areas among profitable private developments, Doha, as the sustainable city of the future, has to create viable, climatically comfortable and pleasant spatial nodes. In particular, the aim is to ensure connectivity among various modes of transportation, places of relaxation, social integration, and interaction among its diverse demographic populations.

This study explores the walkability level in the built environment of Doha city, focusing on one of its neighborhoods, the Al-Markhyia. The aim is to answer the following pivotal questions: Can we consider Doha as a pedestrian-friendly city? Can Doha be considered as a 'walkable' city? In the event that the answers to these questions are negative, the potential for walkability in Doha will be examined. In other words, in an attempt to delineate successful principles for improving the built environment in the forthcoming redevelopment, the study aims to determine both positive and negative aspects of the urban design of the existing built environment. The goal is to respond to the specific question: Is it possible to develop Doha while ensuring that it remains a pedestrian-friendly city? However, before delving deeper into the subject matter, it is vital to consider and understand why people in the Gulf Region are hesitant to walk. Does a cultural perception prioritize movement of cars rather than people? Or, is the growing preference for motorized transport driven by the low price of fuel?

In the past, walking in Doha seemed to be common. The built environment of the old city of Doha, characterized by narrow streets, where walls of the traditional houses created shadows, as well as concentration of the neighborhoods close in proximity to the key necessities and facilities, are testament to the pedestrian realm and culture of the former city life. With the discovery of oil in Qatar and the commencement of its extraction for energy use, fuel became more affordable. At the same time, as oil trading replaced pearl diving-based economy, inhabitants transitioned from walking to using cars in their daily commutes. As a result, at the beginning of this new oil era, the city's transformation was based on American style urbanism. As the city was re-planned, dependence on motorized vehicles increased. These arguments notwithstanding, culture seems to be a catalyst of walkability, rather than an obstacle to walking.

Extant research in this field advocates for the planners and the urban designers to establish new planning principles that consider quality of life, sustainability and walkability as the key elements. The aim of these principles is to define a set of guidelines that would enhance Doha's public realm and encourage its habitants to walk, use public transportation, or ride a bike. These recommendations should also add value to the already established guidelines of Qatar's

sustainability rating system, GSAS. This cohesion would result in a better solution for a long-term city planning, where environmental impact would be reduced during the demolishing and construction stages. By using public transportation, walking or riding a bike, fuel consumption is significantly reduced and the CO<sub>2</sub> emissions consequently decreased. As it is widely recognized that CO<sub>2</sub> emissions are the main driver behind the climate change, their reduction requires a more global approach, even though the effects might be perceived as a local problem. It is possible to anticipate preservation of the local environment and create more social interaction, which could in turn boost the economy of the city (Abu Dhabi Urban Planning Council 2010).

## 2. Walkability in the City

Walking is defined as the basic and the most important form of human mobility. Empirical evidence suggests that walking improves both mental and physical health and increases social interaction among people, thus improving quality of life. Walking efficiently energizes public domain and helps build pleasant and energetic image of the city. Since walking affects the city at different levels, walkability should be encouraged and studied on different scales as well. The best-planned cities are those that encourage their habitants to walk more. Through the use of strategic layout, planned land use, and street layout that offers safe passage and is attractive to the pedestrians, walking can become not only an alternative, but rather the main mode of transportation. While walkability is directly affected by urban design and public life, mixed land use, connectivity, population density and proximity to major necessities and facilities are also its key determinants.

It is essential to understand the main principles of quality design of selected city's planners, such as Christopher Alexander, Jane Jacobs, Kevin Lynch, Alan Jacobs, and Donald Appleyard. Jacobs (2010) suggested that streets and sidewalks are the main public areas of the city. In her view, a well-used street is often safer than a park. J. Jacobs also identified the four physical conditions necessary for dynamic urban life, namely multifunctional neighborhood or district (to create and enrich social life), short blocks, varying age and the condition of buildings, and sufficient density (Hassan, Lee & Yoo 2014). Lynch (1960), on the other hand, defined the legibility of the cityscape as the ease with which its parts can be recognized and organized into a coherent pattern. He defined the 'imageability' as the quality of a physical object that gives an observer a strong vivid image. He further noted:

*“The paths, the network of habitual or potential lines of movement through the urban complex,. . . The key lines should have some singular quality which marks them off from the surrounding channels: a concentration of some special use or activity along their margins, a characteristic spatial quality, a special texture of floor or façade a particular lighting pattern, a unique set of smells or sounds, a typical detail or mode of planting. . . These characters should be so applied as to give continuity to the path. . . The very concentration of habitual travel along a path, as by a transit line, will reinforce this familiar, continuous image”.* (p. 96)

For an urban environment to be deemed appropriate, it must successfully integrate various everyday activities, such as living, working and shopping, in reasonable proximity (accessible by walking) to each other. Properly planned public space promotes pedestrian interaction, as no public life can take place when residents are isolated in their cars. As Hassan et al. (2014) noted:

*“In principle, mixed use, accessibility, community involvement and pedestrian realm, all required compactness and a certain number of populations that allow the society to interact and integrate. Alexander and A. Jacobs, as well as Appleyard, provide density*

*figures promoting medium rather than high or low density. Jane Jacobs also supposed urban density rather than the suburb is required for creating a vibrant urban center”.*  
(p. 332)

Introducing and enhancing walkability in a city can result in a wide range of benefits. By reducing dependency on cars and endorsing walkability, the city can become more sustainable and 'livable', as air pollution, congestion, noise and vibration brought by heavy traffic will be reduced. Walkability also increases property and land value, while also yielding commercial benefit owing to a higher level of footfall. At the individual level, walkability is also highly beneficial, as it promotes health and improves one's quality of life. Finally, it also encourages integration among communities and improves social life.

### **2.1. Walkability, an axiom of urban development**

Walkability is also a major element in contemporary urbanism, as it has been proven to be a vital element of **Smart Growth Principles** (Smart Growth Network - MD Dept of Planning, USA 1997). Indeed, according to Wheeler (2004), “one of the biggest challenges at a neighborhood level is making arterial streets more pedestrian-friendly and livable” (p. 200). Sustainable development of cities requires reducing travel distances for pedestrians, in order to make walking and biking easier and more practical (Litman 2012). Moreover, by reducing travel distances, the number of people on a given street increases, diversifying the range of activities they partake in, thus strengthening the sense of security. As was recently noted, “To foster the walkability, communities must mix land uses and build compactly, as well as ensure safe and inviting pedestrian corridors” (SGN n.d.). Promoting mixing and interaction among people of different ages, social classes, educational backgrounds, etc., is also one of the key principles of Smart Growth. Most importantly, diversity of a neighborhood's inhabitants can help increase its walkability, as it tends to create a complex array of distinct pedestrian fluxes. Thus, it becomes important to offer a range of different housing opportunities and choices, and to provide a variety of transportation choices (mixing transportation systems can actually increase walking frequencies in a neighborhood, rather than discourage it). Other Smart Growth principles also intersect with the notion of walkability. Strengthening and directing development towards existing communities, taking cost-effective development decisions, and encouraging community and stakeholders' collaboration in all development decisions are the basic elements of sustainable development that could help foster walkability in a neighborhood, whether directly or indirectly (Smart Growth Network 2003).

The walkability of a neighborhood is highly dependent on the residents' walking experience. In order to increase it, according to Abdul Karim and Azmi (2013), it is necessary to ensure a right balance between safety and security on one hand, and convenience, enjoyability and attractiveness on the other. Exploring work and leisure walking in relation to neighborhood walkability, in related researches such as Owen et al. (2007), has shown that street connectivity and proximity to retail are positively associated with walking for transport or as function, but not walking for recreation. The relationship is also stronger for weekly frequentation than for weekly minutes of walking, as more-walk-able neighborhoods required shorter walking trips to reach a destination than did less-walk-able neighborhoods.

Consequently, walkability in any given city should be measured based on the specific variables that are pertinent to the study of the human behavior of its residents.

## **3. Walkability and planning regulations in Qatar**

Walkability is a rather vague concept that is endorsed by nearly all of us, despite lack of its precise qualitative and quantitative evaluation. In addition, as walkability is rarely defined in

operational terms, when attempting to develop policies and regulations, the concept proves rather challenging. In the early 2000s, Qatar started working on defining operationalizing the dimensions of public realms, including walkability. At this time, the department for Municipal and Urban Planning was formally established.

Presently, macro-scale policy approach to city building and spatial planning in Doha is dominated by the expert international firms, with the contribution of local urban planning teams. As a result, the situation on the ground is significantly different and somewhat contradictory to the design plan. In order to consider the nature of realization of urban public spaces within the context of a wide range of city building settlements, a typology of new urban landscape should be outlined and discussed in relation to the city's vision and should include the main micro units, such as the existing neighborhoods.

The development plan of the new mega projects in Doha, such as Lusail City, The Pearl Qatar, and Msheireb downtown, also included a master plan study with guidelines for the public realms with consideration of walkability. However, these projects have not yet been integrated within the existing urban fabric of Doha, nor are there any considerations of the relation between existing built environment and the city's morphology.

### **3.1. Walkability in the history of Arab and Islamic cities**

According to a well-known Arabic proverb, walking to the mosque is highly rewarding, and the worshippers who will have the greatest reward ('Hasanat') are those whose houses are further away. In the examples of Arab/Islamic cities, as a response to the aforementioned quote, it is evident that mosque was built in the heart of each neighborhood. Neighborhoods would then organically grow around the mosque and a number of such concentrated neighborhoods would merge to form a city. The city's morphology and its urban spaces, including dead-end streets and small open areas within housing compounds, known as Baraha, were considered as a continuation of the domestic space and were thus under the care of the residents. The hierarchy of the streets and the walkways, with consideration to the transition from public to semipublic, semipublic to semi-private, and semi-private to private spaces, are principles that encouraged walkability and integration of the social domain.

The urban morphology of Doha, like other Islamic cities, was developed considering walkability as the main mode of mobility and interaction among communities. Accordingly, certain physical qualities were deemed necessary for functional walkways. Walkways primarily provide access to adjacent amenities and allow travel on foot from one place to another within and throughout surrounding neighborhoods. The main qualities of good walkways are safety, offering warmth or sunlight when it is cool and shade and coolness when it is not, comfortable space for pedestrian traffic, and a healthy social atmosphere.

Additionally, the best walkways are characterized by the transparency at the boundaries, where the public realm starts to be less public, often when a semi-private or a private property meets the walkway. In such instances, one can see or have a sense of what it is that defines the street and the public realm. In particular, one senses an invitation to view or get to know, even if only imaginatively, what is behind the walls surrounding the private spaces. This is where a sort of tension is formed between the public and the private realms.

## **4. The Research Method**

The proposed methodological approach assists in analyzing the current function, form, unity, and accessibility of Al Markhiya Neighborhood and Khalifa Street. Rather than conducting a quantitative survey, the main analysis performed in this study is based on extant theoretical

studies, prior experiences, and synthesis. Gathering and analyzing these data sources is intended to provide a better understanding of real specific problems of the area of interest for this investigation (Al Markhiya neighborhood and Khalifa Street). The findings yielded are expected to convey a vision for the pedestrian's mobilization and enhancement of the public space.

## 5. Introduction to the context

Al Markhiya neighborhood and Khalifa Street environment is vital to the neighborhood's success as a place for living and working, as well as a commercial destination for visitors. The provision of high quality spaces in the town center, and the neighborhoods surrounding this area, is essential for improving the quality of life for people who inhabit and use these spaces. The area is facing two major streets—Khalifa Street and Al Markhiya Street. These streets are primary spaces for public interaction and activity in Doha. Despite currently being highly important to the daily lives, these streets have lacked refurbishment and good management. Consequently, in number of places in this area, streets and public spaces have been neglected and have become unhygienic, unpleasant and unsafe. This has created problems that go beyond appearance and function, affecting the attitudes and perceptions of the people living around and using our city center. The main issue is that most residents do not perceive their living environment as safe. Indeed, it is apparent that these neighborhoods have been developed for car use, without any consideration for pedestrians (Jacobs 1995).

Given the extent of this problem, it is essential to identify those responsible for addressing it. In other words, is it the responsibility of urban designers, architects, planners and government officials to prepare and implement well-designed, well-ordered and well-maintained neighborhoods, streets and public spaces as an expression of user friendly, secure and easy to get around, well used and safe neighborhoods?

Al Markhiya neighborhood is located in the middle of Doha city and connects city's east part with its western regions. This results in a major flow of commuter traffic between the Al-Dafna area and the Education city, via Khalifa Street; and between south of Doha and Qatar University area via C-ring road. Moreover, major road networks, such as C ring-Al Khor, and D ring-Al Shamal, are crossing through Khalifa Street. Khalifa Street is considered as an arterial road of the city of Doha, connecting major transversal roads. In addition, it is a major road, serving the main surrounding developments.



Figure 1. Case Study Location

## 5.1. Findings:

While the older urban values of density, mixed use, walkability and sustainability became objectives that required concentrated efforts and creativity of urban designers, owing to its strategic location, Al Markhiya always had a great potential to be a unique and self-sustaining neighborhood in Doha. A commercial frontage at Khalifa Street enables the area to achieve a small-scale integrated community. Walkability and economic vitality, along with connectivity and accessibility, enhance both social and economic value of the area. Most importantly, as they evoke the feeling in the residents that they belong to the place, they increase their sense of personal responsibility for its public spaces. Therefore, this neighborhood can be considered as respectful to the traditional fabric of the city with privileges of continuity, walkability, small-scale enterprise and amenities.

However, from another point of view, the problem of walkability in the Al Markhiya area may be a direct result of municipality's failure to invest in infrastructure and refurbishment of landscaped areas.

The aforementioned problems are also evident in the wider Doha city. Problems appear on a variety of urban scales, ranging from land use management to the details of the sidewalk design (comfort, presence of benches, bins, pedestrian crossings, etc.).

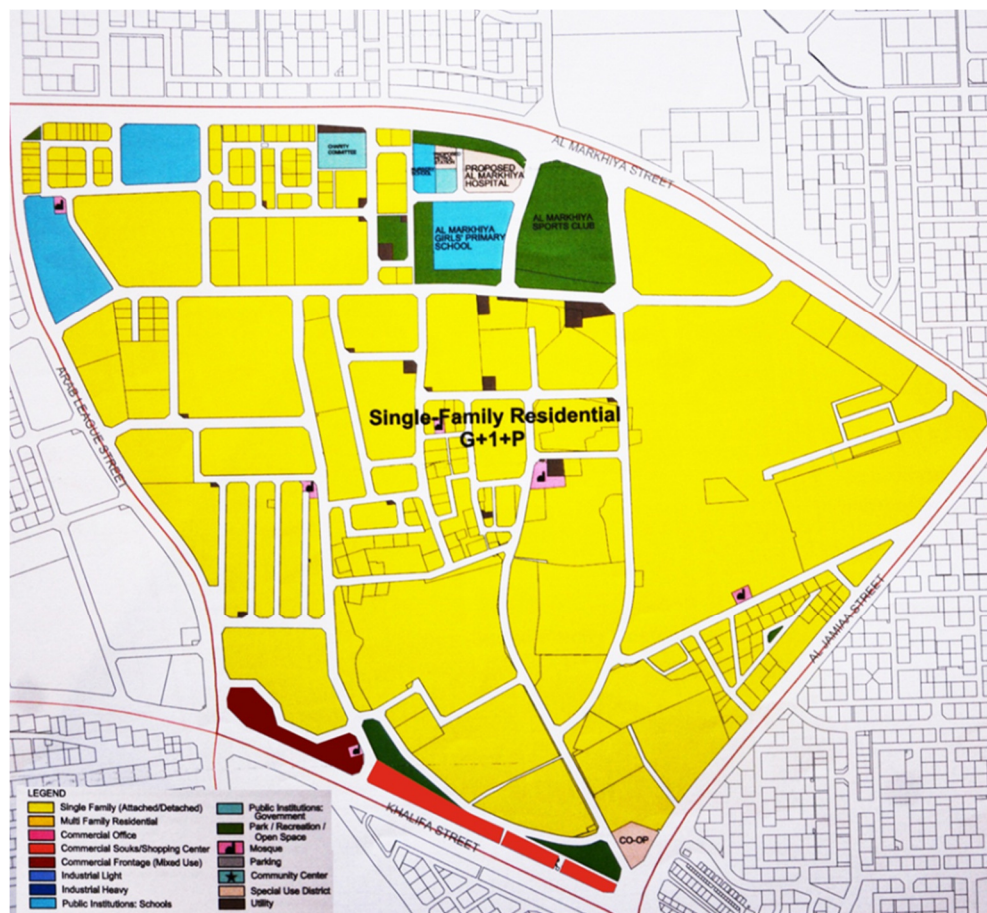
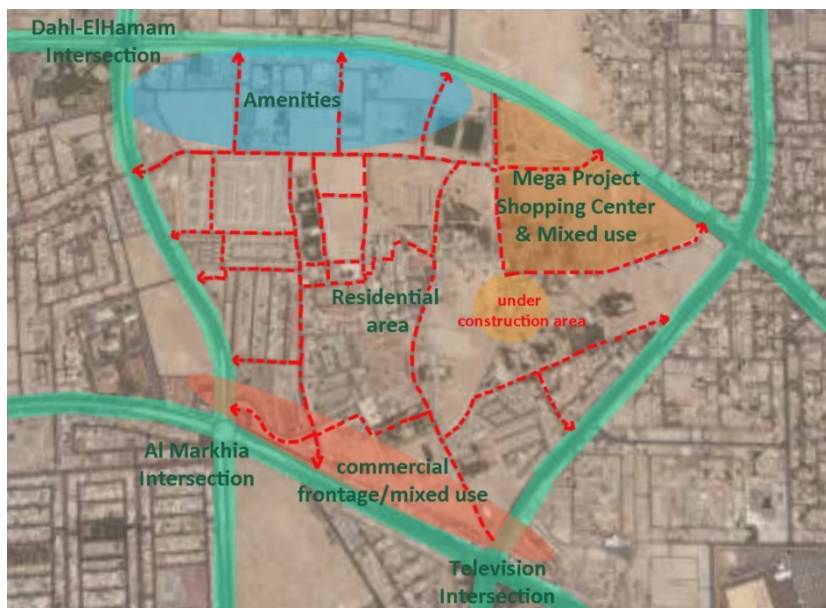


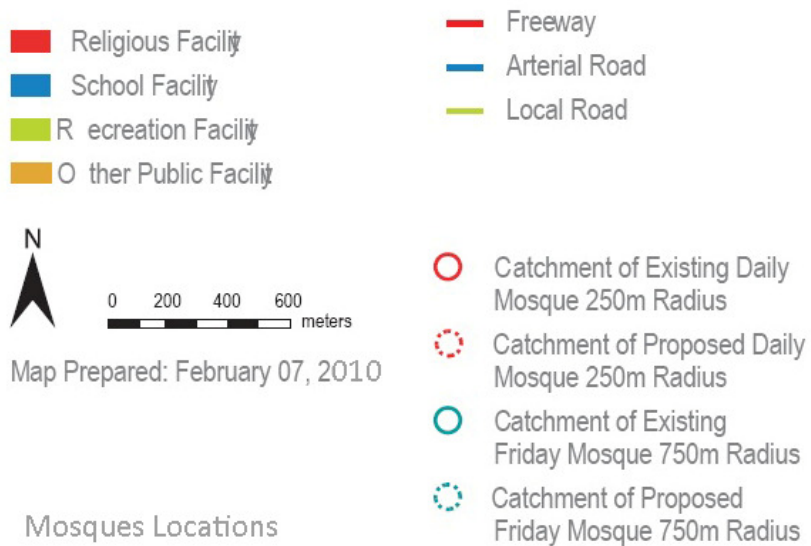
Figure 2. Current Land Use



**Figure 3. Solid and Void showing the morphology of the neighborhood  
The ideal area block size in the Al Markhiya ranges between 100 m and 400 m**

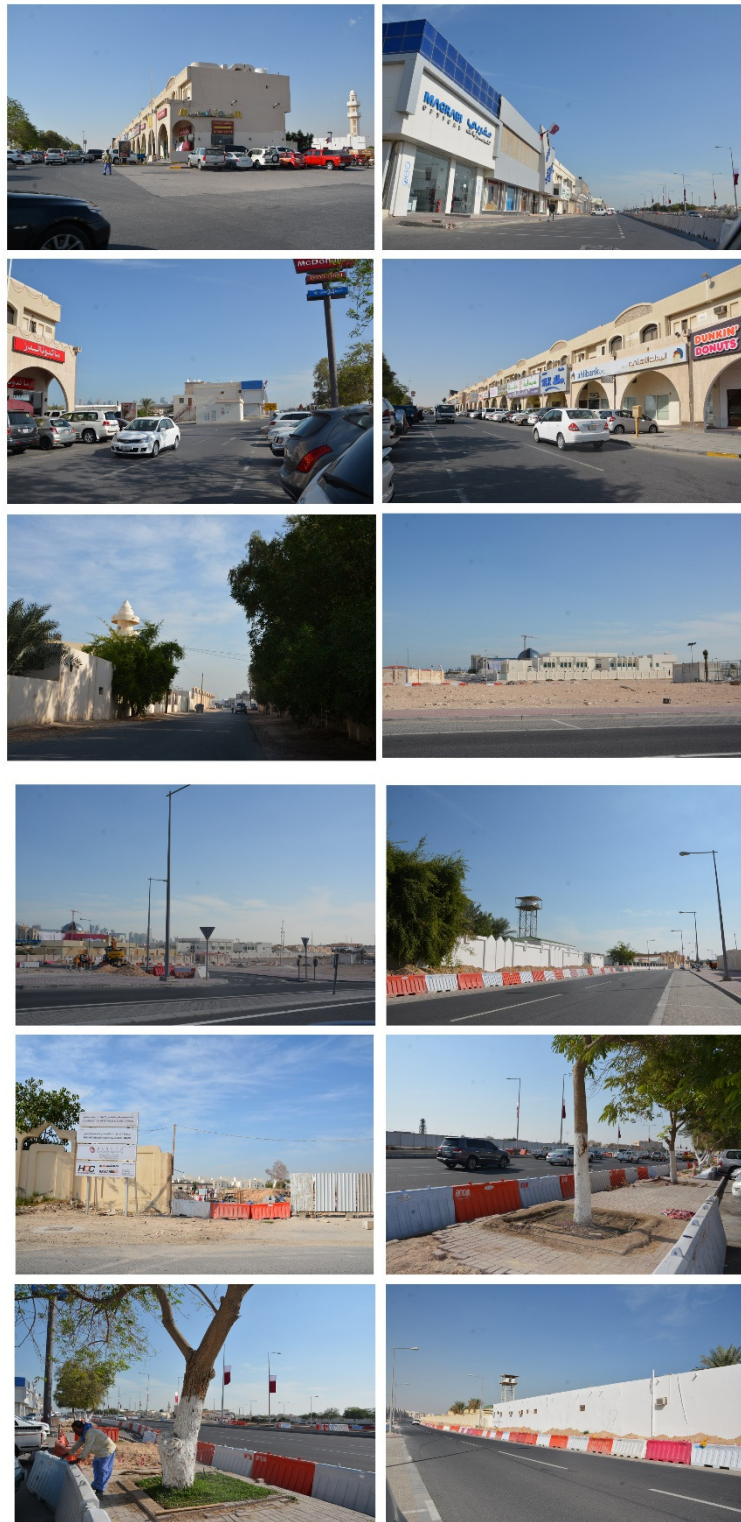


**Figure 3. Solid and Void showing the morphology**



**Figure 4.** Map dated 2010, showing the proposed and the existing mosque locations in Al-Markhiya neighborhood, alongside vital amenities (mosques with retail) in the neighborhoods, *Source: Draft Qatar National Framework 2032*

To analyze and properly assess the area of interest, the built environment variables have been tabulated, and were examined alongside the site maps and photos.



**Figure 5. The 6. Site Images**

## 5.2. Synthesis:

### 5.2.1. Site Assessment

Table 1 outlines the measurable urban variables that can assist in the assessment of the walkability potential in the synthesis of the proposed studied area. These elements are based on Jane Jacob's principles and are divided into two categories—K. Lynch's 'legibility' and 'imageability'. Each element under the heading “The Criteria” is rated in percentages based on the assessment performed during the site visits.

**Table 1. Indicators and Scores**  
**10 indicates “very poor” while 100 denotes “very good” rating**

The Criteria	The definition	Score Ranking (10-100)
<b>"Legibility"</b>		
<b>Connectivity/ Permeability/Proximity</b>	Increasing shortcuts, or rather avoiding detours, eases the task. It also reminds users of the proximity of a given destination and offers a more human scale territory.	90-100
<b>Accessibility/ Convenience</b>	These notions are related to the idea of practicability of the public space. Better understanding of the public space layout and greater comfort can encourage walking.	80-90
<b>Safety/Security</b>	While these elements are obvious, they could depend on very subtle details, especially within the large-scale urban layout.	90-100
<b>Land Use</b>	'Mix-ability' of land use should acquire a certain balance. Too much mixed land use may be unmanageable, whereas too little may tend to 'zone' functions in different areas. Land use should be considered within a human scale.	80-90
<b>Residential Density/ Amenities Density</b>	This notion correlates with the previous criteria. Good balance between residential and amenities density (i.e., services, work, retail, etc.) provide clarity to a neighborhood, hence increasing its accessibility and attractiveness.	50-60
<b>Walking Pattern</b>	The very purpose of a walk can change its pattern, its rhythm and pedestrian's behavior. Streets can be evaluated using a ratio between how many inhabitants use them for service purpose and how many use them for leisure.	70-80

The Criteria	The definition	Score Ranking (10-100)
<b>"Imageability"</b>		
<b>Street Character</b>	Evaluation of the street attractiveness, its presence and how strongly it can imprint into a person's memory. Balance between 'strong' streets and 'weak' streets gives rhythm to a walk.	60-70
<b>'Enjoyability'</b>	'Enjoyability' can be considered as a consequence of the other elements defined in this table. It is, however, an important variable that could make walking in this or any other street the purpose itself.	50-60
<b>Public and Social Behavior</b>	Only human interaction can bring public space to life, whereby greater interaction results in more life. Public relations in a given space can be measured by evaluating the health of the interactions, their nature and purpose, their circumstances, etc.	50-60
<b>Quality of Urban Design</b>	Urban design's main aim should be comfort. The number of benches available, the distance between bins, density of flora, sidewalk width, materials utilized, water management, etc., all play an important role in increasing comfort. Thus, all these elements should be taken into consideration when creating a unique design aiming to foster a pleasant image of the city.	50-60
<b>Serendipity</b>	Defined as 'fortunate happenstance' or 'pleasant surprise', serendipity is notion of haphazard occurrences and unpredictability. How pleasant it would be to meet an old friend when walking to the local supermarket? This sort of haphazard gives a more human or natural air to public space and it can be provoked through intelligent and thoughtful urban layout.	50-60

## 6. Discussion and results

The qualitative surveys conducted on the study site, along with observations and analyses of photographs, lead to the several important deductions discussed below.

**The amenities and commercial shops in the built environment are sufficient** and convenient enough to support a healthy lifestyle in the neighborhood. The existing neighborhood is characterized by considerable diversity in this sector. Amenities and commercial shops are well

distributed and provide a good balance between centrality and accessibility. Indeed, two main areas can be easily identified: the commercial frontage of Khalifa Street, which runs along one of the four sides of the neighborhood, and a mixture of amenities and commercial areas at the boundary of the north side of the street.

**The density of an area is closely related to walkability.** High residential densities are usually characterized by a dense network of 'destinations'. These areas support the presence and proximity of local shops, services, and public transport. However, Al Markhiya neighborhood lacks high residential density, as all housing units in that area are single-family homes. Most housing in the area is grouped into compounds and building blocks. This arrangement decreases the integration among residents living in different compounds. However, there are many vacant and unused land plots in Al Markhiya, which could have been temporarily transformed into green areas. As this valuable initiative never took place, they are presently unusable and contribute to a lower density.

**The streets are designed for cars.** As a result of the design favoring motorized transport, scales are inappropriate for pedestrians and the navigation and signage are aimed for cars only. Most sidewalks are neither properly designed nor enhanced enough for a pleasant walking experience. Limited mobility of disabled and old people has not been taken into consideration in many areas. No shades or street furniture is provided. It is unsafe to walk on sidewalks in Doha in general, as many of the roads are under construction. The contractors are not sufficiently aware of the need to secure alternative pathways. However, it is also possible that the authorities are not strict enough to curb such pedestrian-unfriendly practices.

As previously noted, Al Markhiya neighborhood was not considered when Doha Metro was planned, as there are no planned Metro stations in the studied area (Qatar Rail 2011). On the other hand, there are two existing bus stops that could facilitate longer commutes that are impractical for walking.

## 7. Conclusion

The study presented here outlined some indicators that can be used to examine the walkability level in a neighborhood. This case study was conducted in Doha city, and the analysis findings revealed that the studied area scored higher on the legibility scale than on imageability. This leads to the conclusion that, by increasing the residential density in the neighborhood, walking opportunities would increase. However, in order to increase the imageability score, it is necessary to enhance the public realm and work on the architecture of the buildings. It is apparent that compounds and extensive palaces discourage walkability in this neighborhood, because there is no transparency, no 'imageability', and in turn no enjoyability. On the other hand, the results reported here also reveal that it is possible to achieve walkability in Doha, and Gulf Cities in general, by adopting Western concepts, such as those proposed by Jane Jacob. Moreover, Smart Growth frameworks also provide opportunities to transform the city into a more pedestrian-friendly environment it once was. It is possible to formulate guidelines that are compatible with the existing built environment in the region. Finally, while this study has provided some significant suggestions, it is, as any other research of this type, affected by several limitations. Most importantly, the results reported in this study were derived from a study of a single neighborhood and should be viewed as a first step towards developing the entire city. Thus, while they cannot be generalized, they can serve as a foundation for future work in this area.

Indeed, the following recommendations can be made:

- The planners should aim to encourage walkability by prompting a model inspired by the past that is compact, mixed-use, diverse, transit-friendly, and takes into consideration a hierarchy of buildings and places, all in order to promote face-to-face social interaction (Inam 2014)
- The best way of thinking about urbanism and the material city is through focus on the formal qualities of the city by default rather than as an afterthought.
- The planners are requested to ensure environmental sustainability, safety and personal security in their proposed planning design, planning guidelines and building regulations. In addition, they must establish guidelines for improving accessibility for all, connectivity, and walkability. Their designs should also enhance the sidewalks and pathways and provide furnishings on the streets.
- There is a need for a Transport Strategy that clarifies the government's support of the pedestrian zones. Moreover, it is essential to offer an affordable, integrated, safe, responsive and sustainable transport system. As a broader objective, such a strategy should enhance economic, social and environmental integration and development.
- The planners are required to protect and promote public health.
- The planners should assist economic development.

## Acknowledgment

The author would like to express her gratitude to Dr M. Essam Hallak for insightful advice, guidance and direction, which considerably enhanced the quality of this work. This research was initially part of the assignments comprising the course "Theory on urban form and design" as a part of the master studies of Urban Planning and Design at Qatar University. The author would also like to express her profound gratitude to Qatar University for supporting and funding this research.

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