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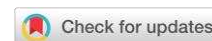
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Original scientific paper

Mapping Safety, Security and Walkability of Historical Public Open Spaces in Post-Conflict Libya: Tripoli as North African Case Study

*¹ Dr. **Khairi Abdulla** , ² Prof. Dr. **Mohamed Gamal Abdelmonem** ¹ School of Architecture, Design and the Built Environment, Nottingham Trent University, Nottingham NG1 4FQ, UK² Department of Architecture & Built Environment, University of York, UK¹ E-mail: Khairi.abdulla@ntu.ac.uk, ² E-mail: Gamal.abdelmonem@york.ac.uk**ARTICLE INFO:****Article History:**

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Keywords:Historical Public Open Space,
Livability,
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Well-being,
Tripoli Libya.**ABSTRACT**

North African cities have been undergoing major transformation over the past two decades following protracted instability, civic uprising, and conflicts, changing their perception from havens to territories of displacements with social, psychological, and physical problems. Historic public spaces in those cities, in particular, form a critical part of urban environments as they have the identity, livelihoods and cross-community engagement in a healthy and fulfilling urban fabric and culture. Whilst there have been several studies on the characteristics of open spaces in urban environments, there is very limited work on the changing perceptions, use and engagement of public spaces in historic cities especially in the post-Arab Spring and its relative instability. This study aims to deploy investigative and creative methods to map, analyse and navigate through the transformation in the perceptions of historic public spaces in Post-Conflict Libya and its divided cities. It will study the users' (locals and visitors) attitudes, movements, and reflections on how those spaces have changed over time. visitors' behaviour in open historical public spaces in Tripoli, Libya. The study explores the relationships between the characteristics of historical public spaces, physical activity, and psychological behaviour. The paper argues that safety and security in public spaces are critical and inherent qualities that inform much of the users' attitudes in historic cities, which has continued to be the case in post-conflict Tripoli.

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Highlights:

- This study introduces an innovative directional distance function model in a super-efficiency form.
- The research employs investigative and creative methods to map, analyze, and explore the evolving perceptions of historic public spaces in post-conflict Libya and its divided cities.
- Places a strong emphasis on understanding the attitudes, movements, and reflections of users, including both local residents and visitors.
- A key finding emphasizes that safety and security in public spaces inherent qualities that significantly influence the perceptions of users in historic cities even in the post-conflict context of Tripoli.

Contribution to the field statement:

Numerous studies have investigated the characteristics of open spaces in urban environments, there exists a noticeable research gap regarding the shifting perceptions, utilization, and interactions of people with public spaces in historic cities, especially after the Arab Spring and the associated disturbances. This research aims to bridge this gap by employing investigative and creative methodologies to chart, analyze, and explore the transformation in the perception of historic public spaces in post-conflict Libya, particularly in its divided cities.

***Corresponding Author:**

School of Architecture, Design and the Built Environment, Nottingham Trent University, Nottingham NG1 4FQ, UK

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1. Introduction

The historical centres of cities in North Africa have developed over centuries and are shaped by a network of interconnecting local streets and intertwined alleyways that connect people and goods in an orderly and fluid manner (Akbar, 1998). The active and secure socio-spatial systems that enable interactions in these cities have developed a complex organization of relationships that include the integration of public and private spaces in a fluid continuum (Abdelmonem, 2016). However, as these historical centres transformed into modern cities, their spatial organisation evolved and changed, leaving traces of the past intimacy, but equally a sense of loss due to the diminishing sense of community, and active urban life. Public open spaces that used to be active centres of daily life have transformed into congested and hazardous traffic routes. Whilst Cairo and Alexandria in Egypt are struggling with integrating high-way traffic routes into their historic fabric, Tunis and Marakish tend to preserve most of their historic centre's characters and move major traffic routes away from their historic core. Libyan cities, on the other hand, are one example of this transformation in the role of public spaces within their historical centres. This problem has been exacerbated by the ongoing conflict, political instability, and weak governance since the Arab Spring.

The historic spaces in Libyan cities have witnessed a deterioration in the quality of life, safety, and connectivity within their historical structures during long periods of conflict and destruction. This has made many Libyan cities unbalanced and unfriendly to pedestrians, in a unique case within the rich North African cities. Libyan cities are often heavily reliant on vehicle traffic, with a major route contributing to increased and intensified traffic congestion, pollution, and inadequate and unsafe pedestrian crossings, affecting the ability of local residents and users from their inherited sense of belonging, comfort and safety (Lakhder & Dugeny, 2010; Abdulla, 2019). Additionally, the planners and local authorities have shown limited consideration for the needs of persons with disabilities in terms of ease of walking, and limited attention seems to be given to the safety and security of pedestrians when determining urban quality of life. This has led to higher rates of traffic accidents and associated fatalities (Lakhder & Dugeny, 2010; Abdulla, 2019).

Yet, in the absence of a methodological approach and systematic analysis of those perceptions and attitudes within historic cities, planners and urban designers have limited knowledge and information about the factors impacting users' perception and engagement with post-conflict historic cities. This paper aims to fill this gap and offer an innovative framework and systematic analysis of a planning process informed by understanding users' and residents' perceptions and priorities. There has been little research done to comprehend the historical public open spaces, even though numerous studies have highlighted weaknesses and inadequacies in public transportation and urban life in those cities. With an emphasis on the historic area of Tripoli, this study examines the historical open public spaces in the city centres of Libyan cities as a case study of emerging cities going through internal conflict. By examining the elements, features, and patterns that affect the daily lives and activities of users in those spaces, it looks into how the quality of POS influences the growth of livability in the city centre. This paper also seeks to examine the difficulties and success aspects that influence how walkability is perceived in Tripoli's historic open spaces. It will look at the ideas and components of safe public spaces in post-conflict cities. The opinions of Tripoli experts, policymakers, and common people will be noted in this context and analysed.

1.1 Historical Public Open Spaces

There are numerous studies that emphasize that POSs are essential elements that provide functions such as "recreation, community health, connection with nature, and social or environmental preservation" within a city's part (McCormack et al., 2010; Stanley et al., 2012; Pradinie et al., 2016; Carmona, 2019). POS have been fundamental sites for political, economic, and cultural activities since ancient civilizations and up to the present day (Lévy, 2008). POS vary in shape, size, and typology, including squares, plazas, streets, parks, urban squares, waterfront promenades, markets, and sports fields (Askari & Soltani, 2019; El-Basha, 2021). However, no recent study was found to focus on open public spaces located in historical areas. Retaining historical POSs preserves tangible and intangible heritage elements such as surrounding building facades and activities, embodying the life and collective memory of cultures (UNESCO, 2021). In the past, open public spaces served as multifunctional places, providing opportunities for sports,

watching matches, social, political, educational, and commercial interactions. (UNESCO, 2021) defines cultural heritage sites as "areas including archaeological sites that have outstanding universal value from historical, aesthetic, ethnological, or anthropological perspectives." Furthermore, UNESCO states that the protection of historical areas in cities should not be limited to preserving individual historic buildings but should encompass all elements within a comprehensive and multidimensional urban structure (UNESCO, 2021).

According to Camp (2010), "the development of the Athenian Agora began in the 6th century BC during the time of the legislator Solon," the origins of historical POSs can be found in the Greek Agora (public square). Since then, markets, leisure time, and cultural events have all been connected to POSs in Greek cities. Even though the concept of public use of space may be found in ancient Mesopotamia, where Sumerian King Gudea (about 2340 BCE) established the first planned park-like landscapes, POSs have been used for far longer (Gothein, 1928; Ejroushi, 2020). During the Renaissance, POSs played a significant role in the transformation of European cities, as public spaces hosted a variety of social and recreational functions (Wycherley, 1976). Meanwhile, Cordua (2010) drew attention to streets, squares, and plazas in European cities (Lévy, 2008). Since then, the importance of developing open public spaces in European and Arab cities has increased, and there has been a significant awareness of the requirements of public spaces.

Historical POSs in city centres are complex and fascinating places that can have a wide range of meanings and uses. Literally, a historical POS is a spatial public area located in the historical part of a city (Lévy, 2008). Madanipour Gehl (2007) noted that "POS has become an integral part of cities throughout history, to the extent that human settlements cannot be imagined without it." Unfortunately, in developing countries' cities like Tripoli, H-POSs are mostly used as dumping grounds, informal commercial activities, and parking lots (Elkekli, 2014; Abdulla et al., 2016). This research looks into historical POSs and the ways in which the dimensions of historical open public spaces impact activities in Libyan cities, particularly in Tripoli, Libya. It explores the specific concept of H-POSs within the urban context of Tripoli and the historical areas within the city. As explained in the first section, many H-POSs have deteriorated over time due to lack of maintenance, vandalism, low-quality repairs, and changing physical appearances in different periods depending on who has authority over Tripoli. To understand user needs in H-POSs in Tripoli, this research aims to explore the factors that enhance visitor activities in H-POSs. Through a mixed-methods approach, including experimental analysis and a case study of four different historical open public spaces, surveys, direct observation, and focus groups will be conducted.

In recent years, research on POSs has become more prevalent due to fundamental changes in public life resulting from digital technology and the Internet of Things, which have altered the essence of traditional urban spaces (Abdulla, 2019). Therefore, many scholars and authors have attempted to define the characteristics of POSs from different perspectives and identify the factors that contribute to their success. A pioneering study by Lynch (1964) identified five factors that should be present in POSs to ensure their success: vitality, sense, fit, access, and control. (Jacobs & Appleyard, 2015) proposed seven essential goals: identity, livability and control, access to opportunities, authenticity and meaning, community and public life, self-reliance in the urban environment, and an environment for all (i.e., inclusivity and specific access for people with special needs).

Gehl & Gemzøe (2004) and Gehl (2011) have emphasized on several occasions various design aspects that encourage a user-centered approach in designing and using open public spaces. According to Gehl, comfort, enjoyment, and protection are fundamental criteria for any successful POS. He describes that the time people spend in a place in the city depends on their sense of comfort on both psychological and physical levels, and if the level of comfort is low, the time spent in POSs will be short. As for enjoyment, it deals with how to delight users with positive aspects of weather, enjoying views and horizons, the artistic quality of the design of the POSs and its fine details, and the pleasure of experiencing the natural environment (trees, plants, water). As for protection, it encompasses a wide range of preventive measures provided by the place to reduce negative experiences, including safety and security, shelter, and protection from traffic movement.

Similarly, the Project for Public Spaces (PPS), a global organization focused on public space projects, has attempted to establish specifications for successful open public spaces, linked to four main criteria: uses

and activities, comfort and image, access and linkages, and sociability. Three key factors are associated with the effective use of open public spaces, including user needs, quality of physical features, and spatial structure (Abbott, 2015). Considering user needs is fundamental to designing any good open public space, requiring a design that attracts people, facilitates their activities, and encourages them to spend longer periods of time in the space while engaging in these activities (Francis, 2003). At the intersection of academic and policy literature, scholars discuss ways to shape open public spaces and understand how people perceive and use them.

There is a glaring gap in research, and the amount of it is very small when it comes to Tripoli. (Shawesh, 2000) examined the physical characteristics of the city's architecture and urban forms through the natural environment, houses, streets, open spaces, markets, and mosques, for instance, while evaluating changes in Tripoli's built environment's identity. Contrarily, studied public spaces in Tripoli's urban centre in her thesis by examining the factors that influenced its development and alteration during three distinct historical periods: Tripoli's Ottoman occupation, its time as an Italian colony, and the post-colonial period. This paper offers crucial new insights into understanding the current configuration of Tripoli's historic public squares as an illustration of how conflict in emerging cities directly impacts citizens' daily lives.

1.2 Evolution and transition of post-conflict Historic Open Spaces Libya.

In order to understand the history of public open spaces in the city of Tripoli, it is important to comprehend the historical pattern of the development of public squares over time. The city centre of Tripoli has been shaped by different periods throughout its history. Since the arrival of Islam to Tripoli in 643 AD (23 AH in the Islamic calendar), life, language, religion, privacy, and living patterns have changed throughout the entire city of Tripoli (Lakhder & Dugeny, 2010). Public squares or public open spaces became an important element in Tripoli and in all Islamic cities. Therefore, in Tripoli during the Islamic era, POSs included mosques, markets, and public streets, and sharp gender considerations were applied as is the case in most Islamic cities. Mosques, markets, and public streets were established based on the belief in privacy, in addition to compliance with Islamic law (Sharia) regarding "neighbour's rights" (Lakhder & Dugeny, 2010; El-Hasumi, 2018; Akbar, 1998). Figure 1 depicts the city and its port in 1746, with the area within the walls connected to the harbour (Alakhal, 2017).

During the 16th century, North African cities were significantly influenced by the Ottoman Empire, including Tripoli, which became an Ottoman province after many years of Spanish occupation. El-Hasumi, (2018) states that since the Ottomans took control of Tripoli, the city lost the Islamic urban style that previously influenced and led public spaces before the Ottoman occupation (El-Hasumi, 2018). On the other hand, as shown in Figure 2, Tripoli began to rapidly grow in size during the Second Ottoman Period, resulting in the formation of complexes of buildings, streets, and open spaces that combined the central mosque with various religious, educational, funerary, and market institutions (Elkekli, 2014). El-Hasumi (2018) argues that public open spaces expanded outside the city walls during the Ottoman era and were used as markets within the city. The first modern plans for Tripoli were prepared during the Second Ottoman Period, which included the planning and construction of new markets, renowned higher schools, hospitals, post offices, orphanages, and squares (Carmona, 2019). Planning outside the city walls also became a major activity for municipal authorities, leading to the growth of specialized bureaucratic and technical administration (Silva, 2016). El-Hasumi (2018) affirms that Tripoli's market was considered an external world where the city's inhabitants gathered within the walls to express themselves and communicate for various purposes, serving as an active open space that naturally responded to the increasing demand for broader urban areas.

On the other hand, during the Italian occupation of Libya (1911-1943), the character of the city of Tripoli changed significantly thanks to the new Italian authorities (Shawesh, 2000). A large part of Tripoli's historical nucleus was built outside the city walls during this period (El-Hasumi, 2018). The Italian authorities designed a plan for Tripoli according to European urban planning and design principles, transforming the city into a major urban centre with a well-planned modern commercial centre outside the old city walls (Abdulla, 2019).

In 1939, Tripoli's new urban core was created around the Cathedral Square (Algeria Square). The city's POSs were redesigned as shown in Figure 3, Figure 4, and a new urban centre was created, giving the city

a contemporary aspect in the 1930s and early 1940s (Fuller, 2000; El-Allous, 2016). Similar to this, Micara (2021) noted that the creation of a new plaza at the gates to the old city and the castle during the Italian era was a noteworthy effort. This area later on became the city's main public space. In addition to the goal to demonstrate the authority of the Italian dictatorship and improve military services, the coastline road and waterfront were also built alongside the city's historic centre at this time.



Figure 1. (Left) Plan of Tripoli in 1559 (Alakhal, 2017).



Figure 2. (Right) The Ottoman early urban activities outside the city walls around 1910 (Mezughi).



Figure 3. Development plan for Tripoli 1914.



Figure 4. Seafront and the Corniche with a pedestrian pathway (Grisoni, 2020).

After 30 years of Italian colonization in Libya, the period of Italian occupation ended in 1943 due to World War II. Following Libya's independence in 1951 and the discovery of oil in 1958, the Libyan people gained freedom in using the Italian area in Tripoli, and all streets and squares became accessible to them. However, during this period, the urban fabric of Tripoli changed. The city centre was separated from the waterfront by a highway, and the coastal area of Tripoli was relocated, justifying the change as part of expanding port activities as shown in Figure 5. Additionally, three historical buildings were demolished to create Martyrs' Square, including the Real Miramare Teatro, the National Insurance Institute building, and the Sidi Hammoda Mosque, as depicted in Figure 6 (Ejroushi, 2020).

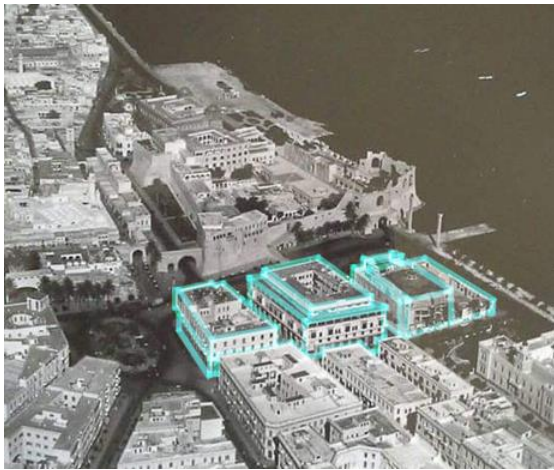


Figure 5. Locations of the main three buildings were removed.



Figure 6. Moving the waterfront into the sea to create the highway. Tripoli, Flickr.com. (accessed on 10 May 2023).

Therefore, the POSs in the historical part of Tripoli have undergone several changes during different periods, giving them historical, social, economic, and political importance. During the Ottoman rule, the open public spaces in Tripoli were used as markets and venues for religious events, representing the strength of the state. After the Italian occupation, the use of POSs continued and expanded. Additionally, new public spaces were created, but the new Italian district in Tripoli was primarily used by Italian settlers. After Libya's independence, the city centre of Tripoli was opened for Libyans to use and visit. However, the current reality of the Libyan city shows a weak relationship between user requirements and POSs within the city, especially regarding the key parts of the city centre (public squares and streets). Public squares (such as Algeria Square and Martyrs' Square) and streets (such as Mazran Street, Omar Al-Mokhtar Street and Rasheed Street) reflect the original concept of urban public space and play a role in enriching the city socially, economically, and politically. The Tripoli region in northwestern Libya is a case of explosive urban growth and urban poverty, which has become an emerging issue in Libyan cities in general. Although Libyan policy designates land for open spaces, they are often unavailable due to weak enforcement and other issues (Abdulla, 2019).

1.3 Users' Needs in Public Open Space

(Gehl, J., 1987) explained the quality of POS based on the types of activities users engage in: social, optional, and necessary activities. Previous research has often been descriptive regarding the success and failure of POSs, focusing on three main aspects: use, activity, and movement. Similarly, there are three main factors associated with the effective use of POS: user needs, quality of physical features, and the spatial structure of the space (Abbasi et al., 2016). Therefore, considering user needs is the key element in any successful design of POSs. Designs that attract people, facilitate their activities, and encourage them to spend more time engaging in these activities are considered the best. It can also be said that quality is related to usability, with certain criteria depending on people's needs and perceptions. If POSs do not meet the users' needs, regardless of other aspects such as aesthetics or the environment, they cannot be considered successful as public open spaces (Askari & Soltani, 2019).

POSs typically possess functional and tangible qualities that positively or negatively impact social interaction, user comfort, and safety, thus attracting people to utilize them. The physical and functional attributes of POSs are linked to activities, accessibility requirements, physical amenities, location, and surrounding land uses (Montero Avila, 2001). As mentioned earlier, social openness, uses and activities, accessibility, connections, comfort, and image are general criteria for the success of POSs spaces. These attributes influence the enjoyment of using POSs and the social life that takes place within them. (Francis, 2003) defined user needs as the facilities and experiences that the public seeks when enjoying public open spaces, and conflicts among users can arise when their demands are not met or when there is conflict between different user groups. Ultimately, public open spaces are evaluated by individuals (i.e., users) based on how well they meet their needs, and this is referred to as a sense of place, which prompts people

to make comparisons and evaluations based on this criterion, but not necessarily based on national attachments to the place (Stokols, 1981). Carr et al., (2007) added six user needs in POS, including comfort, relaxation, passive participation (enjoying the scene without actively participating), active participation (with physical involvement), and discovery. In this research, POSs in historical areas were broadly defined as "spaces existing in the historical zone or open spaces surrounded by historical buildings intended to provide public activities and accessible to the public free of charge".

2. Methodology: Analysing users' perception in historic public space

To understand the nature and dynamics of public activities in historical spaces in traditional cities in North Africa; Tripoli, Libya was taken as a case study in this paper, representing a city experiencing local conflict. The investigation in this paper should focus on the relationships between the characteristics of historical public open spaces in Tripoli and the well-being of users concerning physical activities and social interactions in those spaces. A comprehensive review of the literature was conducted to identify user factors in the use of public space. Figure 7 illustrates the conceptual framework for understanding the integrated impact of safety and security, comfort (aesthetics, planning, management, and pedestrian facilities) on user visits to Tripoli public spaces.

The paper provided a thorough critical assessment of POSs in their theoretical framework in order to accomplish the research goal. To examine different facets of the topic, this research article makes use of several data collection approaches. This makes it possible for researchers to get a more complete and all-encompassing view of reality, illuminating various facets of a particular event and offering a deeper comprehension of the research issue than a single approach would. Case studies, document analysis, surveys, observations, and focus group discussions are some of the mixed methodologies. This study is an empirical investigation on Tripoli's historical public places and the variables affecting their users.

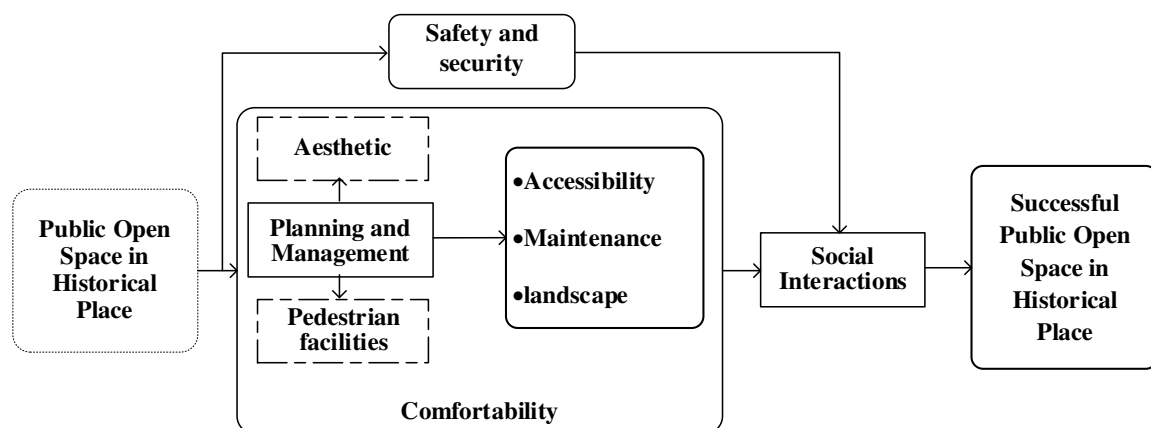


Figure 7. Conceptual framework of factors that affect users' visits to historical public open spaces.

2.1 Empirical research and analysis

In this research, the case study approach was used, where four different POSs in the historical neighbourhoods of Tripoli were selected to ensure the diversity and comprehensiveness of the dataset and analysis. As described by Yin (2013) "Case study can investigate a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident. Furthermore (Song et al., 2016) highlighted that a case study is an appropriate method for exploring phenomena in ambiguous urban spaces. (Yin, 2013) also emphasized that cases can include organizations, processes, programs, neighbourhoods, institutions, events, and other phenomena. The historical area in Tripoli, Libya, was chosen as a case study to understand the concept of historical public spaces and the factors influencing users and their decisions in using the place. Additionally, four locations were selected as case studies, as illustrated in Figure 8, with the following characteristics: Omar Al-Mokhtar Street (Figure 9) is a case study of H-POS with poor infrastructure and few pedestrian use rate, A case study of H-POS with a high pedestrian use rate and strong infrastructure is Martyrs' Square (Figure 10), whereas a case study of a POS with a low pedestrian use rate and good infrastructure is Algeria Square

(Figure 11), and Al-Rasheed Street (Figure 12) is a case study of H-POS with a lot of pedestrian use rate and poor infrastructure.



Figure 8. Four public open spaces were used as case study areas; 1: Omar Al-Mokhtar Street, 2: Martyrs' Square, 3: Algeria Square, 4: Al-Rasheed Street.



Figure 9. Omar Al-Mokhtar Street.



Figure 10 Martyrs' Square.

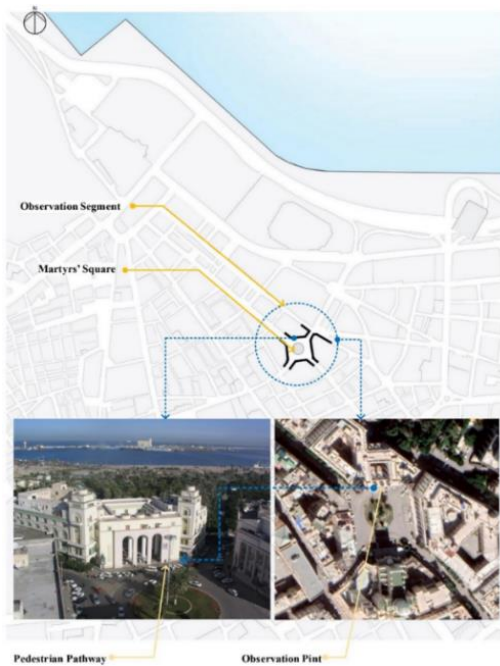


Figure 11. Algeria Square.



Figure 12. Algeria Square.

Observation was used as a qualitative data collection tool during the fieldwork. This tool was chosen because the researcher needed to understand the phenomenon in its context, in the field. The observation included monitoring the physical environment, with a particular focus on pedestrian behaviour. (Marshall & Rossman, 2015) described observation as a "systematic recording of events, behaviours, and artefacts (objects) in the chosen social setting for study." The observation involved spending 30 minutes in the four specified studies at four different times of the day (morning, noon, evening, and night) twice on weekdays and once on weekends, between 08:00 and 23:00. The camera was used to capture photographs, and visual notes, behaviour mapping sheets, and pedestrian count sheets were used as tools in the observation.

2.2 User and Professional Questionnaire Survey

The most important part of the research was the design of relevant and valuable data collection questions to achieve the paper's objective. The study conducted two separate survey questionnaires, one targeting users of the selected POS as case studies, and the other targeting professionals and experts related to the topic. This aimed to gather data on the obstacles and success factors concerning users' prolonged visits to H-POS in Tripoli. The original questionnaires were designed in English and then translated into Arabic. The data collection tool was guided by the "Neighborhood Environment Walkability Scale (NEWS)," "International Physical Activity and Environment Network (IPEN)," "Neighborhood Quality of Life Survey (NQLS)," and "International Physical Activity Questionnaire (IPAQ)" (Craig et al., 2003; Saelens et al., 2003; Cerin et al., 2008).

Participants were selected using a suitable random sample from each of the four case study regions. Based on prior research, the authors created questionnaires for users and pertinent experts that were concise, clear, and self-completable without bias or ambiguity (Barrett & Finch, 2013). A total of 520 questionnaires were distributed to users in the four case study areas (130 in each area), resulting in 427 valid responses, achieving a high valid response rate of 80%. The study followed the suggestion by (Payne & McMorris, 1975) stating that for populations exceeding 100,000, the appropriate sample size for the required accuracy and reliability is 384. A total of 130 questionnaires were distributed to relevant professionals (mostly architects, urban planners, and landscape architects) in Tripoli, resulting in 108 valid responses, with an exceptionally high response rate of 83%. A total of 427 responses were collected from all four case study areas, including 26% (n=111) from Algeria Square (AS), 25% (n=109) from Martyrs Square (MS), 24% (n=105) from Rashid Street (RS), and 23% (n=102) from Omar Al-Mukhtar Street.

2.3 Focus group discussion (FGD)

Guided Focus Group Discussions (FGD) were the third data collection method employed during the fieldwork to supplement the survey results with information based on expert human judgement (Seale, 2017). Because the participants were professionals with years of expertise in the fields of public spaces, public space design and management, and the historical area in Tripoli, the validation procedure using focus groups was thought to be reliable. Government representatives and users were included in the guided discussions to gain a greater understanding of their perceptions of Tripoli's ancient public spaces, the obstacles that prevented people from using them, and the motivating elements for doing so. The guided discussion session had three main objectives: defining and outlining the challenges and success factors in Tripoli's historic public spaces, creating a relaxed but semi-formal atmosphere to encourage participants to discuss all facets of Tripoli's historic public spaces in-depth, and updating the research findings and tactics after validating them with the focus group participants.

The focus group participants were formally invited, and when requested by the participants, phone calls were made to confirm their attendance. 15 participants—eight in one session and seven in the other—participated in the focus group discussions for this study, and each had relevant experience with Tripoli's public and historical places. Participants in Group A included an expert from the government and municipal authorities in Tripoli, urban planners from the private sector (an architect), local urban planning offices (the Tripoli Municipality), and a user of public spaces in Tripoli. A representative from the Libyan Parliament, local communities in central Tripoli, local urban planning offices (Tripoli Municipality), the private sector, an architectural engineer (Libyan National Consultancy Office), and a user of public spaces in Tripoli participated in Group B. There were also two experts from the government and local authorities in Tripoli.

3. Results

3.1 Barriers Limiting Activity in Tripoli's Historic Public Spaces

As previously mentioned, the aim of this study is to identify the main barriers that hinder physical activity and social participation in the historical public spaces in Tripoli. The study presented four different aspects of how physical activity and social participation are practised in these public spaces. This paragraph evaluates the time spent walking in each of the case study areas. The results showed that people do not spend a long time walking in the city center of Tripoli, and approximately 40% of the participants in the user survey prefer to spend 30 minutes or less in the four case study areas. On the other hand, one of the important findings in this study is that nearly 60% of female respondents in the user survey prefer to spend 30 minutes to an hour or more than 60 minutes, contrary to some previous studies that concluded that men spend more time in public spaces. This indicates that there are gender-related differences in the preference for spending time in historical public spaces in Tripoli. It's worth noting that these findings highlight the importance of considering gender-specific factors when planning and designing public spaces to encourage physical activity and social engagement.

The observation method found that more than 70% of the users are males, and the number of females using public spaces in the evening was limited. This partially reflects the conflict in Libya, in addition to social customs that largely restrict women from going out alone in the evening. Similarly, about 50% of all participants visit the four case study areas daily or twice a week. The results showed that "Al-Rashid Street," which is classified in this research as a poorly conditioned area with high physical activities and high social engagement, had the highest number of users during weekdays and weekends. This is attributed (according to observation data) to the diverse daily activities practised in this street, such as shopping and work, which are the most significant factors that encourage people to visit and revisit public spaces in the city centre of Tripoli. This supports the statement made by (Appleyard, 1980) that successful and active public spaces can only be achieved by achieving a proportional balance between different user groups and activities.

According to the study, users' opinions of using POS in historically significant locations are influenced by their age, experiences, and capacity to devote time to visiting those venues at various phases of life. The majority of study participants 50% were in the age ranges of 18–29 and 30–39 years, and they spent more than 60 minutes exercising and interacting with others at the four study locations. However,

according to the prior findings, only around 55% of participants in the age brackets of 40–49, 50–59, and beyond 60 years spent 30 minutes or less. As previously indicated, Tripoli's local administration does not administer the public spaces in the city centre and does not have a formal policy for managing them. Tripoli is typically a car-oriented city. Walking to work and carrying out regular tasks like shopping may be the only physical and social engagement in the city. Numerous barriers, including worries about safety, pedestrian facilities, planning and management, aesthetics, and socio-cultural considerations, may restrict people from engaging in physical activity and social interaction, preventing them from spending much time strolling through Tripoli's public places.

3.2 Safety and Security

Cities need to strengthen safe infrastructure to enhance the quality of living and well-being ; (Burton & Mitchell, 2006). The United Nations - Housing and Urban Development (Un-Habitat, 2013) has pointed out that public safety is a collective effort that requires collaboration from various stakeholders, including the government, municipalities, and the community. The results align with those of (Abdulla et al., 2016) in Tripoli, there is a lack of safety among users of POS, attributed to the ongoing conflict and instability since 2011. In this section of the survey, participants were asked about whether the POSs in the historical part of Tripoli are safe for public activities, and the responses varied depending on the field. Around 46% of architects gave the performance in terms of safety and security a good or exceptional rating, compared to 46% of civil engineers, 50% of landscape architects, and 60% of urban planners who gave it a bad or very poor rating. 60% of public space managers regarded the safety and security performance as inadequate, compared to 50% of city planners who found it to be acceptable. This demonstrates that Tripoli's public spaces are not appropriate for walking, supporting the analysis in the literature review section and highlighting the necessity of determining the dependability of security and safety features to create pedestrian-friendly environments.

The results of this study indicate that the political situation in Libya remains fragile, and the security situation remains dangerous and unpredictable at present, which is supported by the (Abdulla et al., 2017) indicators indicating an increase in crime rates in Libya. Social and security safety were discussed in the collective interactive sessions as major obstacles that hinder walking in Tripoli. This finding was consistent with the responses from ordinary people and professionals. The security and safety barriers have a strong correlation with the time spent walking in public spaces and the likelihood of revisiting them in the future. For example, the absence of police patrols after 8:00 PM in downtown Tripoli provides opportunities for criminals to roam the streets, as indicated in the results of the collective interactive sessions: "The problem is that police patrols operate in Tripoli during the daytime, causing traffic congestion everywhere, while at night, after 8:00 PM, they start to disappear due to criminals, who then begin their operations after this time, preventing people from using public spaces" (Private sector, Collective interactive session - Group A- B6). Therefore, the results of the public and expert surveys suggest that the absence of safe pedestrian facilities, traffic congestion interfering with pedestrian movement in downtown Tripoli, and the lack of police presence in the streets, along with the prevalence of crime and disregard for the law, discourage people from walking frequently in downtown Tripoli.

3.3 Institutional, legislative, management and financial barriers

As the capital, Tripoli faces fundamental challenges, including a lack of urban design maintenance, which has been overlooked by successive Libyan governments, evident in the poor upkeep of public spaces, pedestrian facilities, pedestrian crossings, street furniture, and so on (Lakhder & Dugeny, 2010). Approximately 60% of the total participants, including experts, agreed that there is a deficiency in facilities such as sports equipment, accessibility for people with special needs, physical amenities (such as seating or dining facilities), connectivity between most places in Tripoli, and availability of public transportation. Providing pedestrian facilities is a crucial element for the success of pedestrian-friendly cities. In this survey, participants were asked if the public spaces were suitable for pedestrians through pedestrian facilities, and around 55% responded that pedestrian facilities were few or very few.

The questionnaire responses in the four studied areas confirm the lack of pedestrian facilities, such as seating areas, shelter s, public restrooms, or social gathering spaces. The compiled interactive sessions

indicated that due to the financial constraints faced by the Libyan governments, pedestrian infrastructure is often excluded from the main budgets. As a result, experts emphasized the need for pedestrian-friendly facilities, such as clear pedestrian platforms, crosswalks, marked pedestrian pathways, pedestrian signals, level separations, tunnels, canopies, coordinated green spaces, street furniture, and public transportation access and interfaces that make public spaces more pedestrian-friendly. "I agree with the statement that facilities are one of the most important factors influencing users of public spaces to stay longer and revisit those spaces... such as comfortable facilities, safe amenities, and transportation" (Municipal Urban Planning Office, Compiled Interactive Session - Group A - B3).

In this context, the institutional, legislative, administrative, and financial realities in Tripoli constitute the most significant obstacles affecting activities in the H-POS in the city. According to Urban Planning Law No .3 and Law No .19, urban planning activities are divided into four main levels: national, regional, local, and urban (Libyan Government, 2001). Moreover, it can be observed that there is no agency with a broader authority and responsibility regarding the management of public spaces in Tripoli to establish soft infrastructure such as events, programs, and activities, unlike the hard infrastructure (such as buildings and street design, etc.). On the other hand, (Abdulla et al., 2016) pointed out that centralized planning in Libya might overlook the necessity of local issues, resulting in informal and delayed development. Since 2011, many public sector activities in Libya have been proven to be dependent on unpredictable funding. Participants agreed that Libyan cities are not pedestrian-friendly due to the conflict and instability in the country since 2011, mainly because of the lack of clear jurisdiction and overlapping competencies among Libyan institutions. They also highlighted the shortage of financial support, ineffective management, and the prevalence of financial corruption in Libyan government institutions as factors hindering the maintenance and efficient management of POSs.

The gap in policies was also noted in the focus group discussion, including the absence of specific planning guidelines for the location of public facilities. Currently, planners decide on the location based on site characteristics instead. The following data clearly illustrates how participants agree on the institutional, administrative, and financial obstacles in POSs in Tripoli: "Currently, in Libya, we have many administrations that are related to public spaces... There is no specific strategy for creating new public spaces and/or managing and maintaining existing ones... Additionally, weak coordination among relevant entities is one of the main issues in Libya at present" (Local communities in central Tripoli, FGD-GB-P3). Another participant said: "For me, the main obstacle in Libya at this time is corruption... Corruption spreads across all government ministries and departments... It hinders maintenance and the creation of more appealing activities in public spaces in Tripoli" (Private sector, FGD-GA-P6).

3.4 Tracing spatial implications of Socio-cultural barriers

According to Frank and Engelke (Frank & Engelke, 2001), personal obstacles are subjective factors that make it difficult to move, whereas environmental barriers are fixed circumstances that limit activity. The decision to travel may be influenced by individual variables such as lack of time, motivation, social support for exercise, weather, lack of health awareness, and automobile ownership. Social and cultural hurdles are one of the biggest impediments to making Tripoli's old public areas livelier. The findings of this study suggest that one of the most significant obstacles to using H-POSs in Tripoli is the city's social and cultural reality, "Libya is an Islamic nation; its society is religiously conservative; Libyan families need privacy when present in old public places; and based on my experience, families won't visit places that prioritise single men or teenagers, any future strategy or plan must thus take this into account. (Architect, National Libyan Consultancy Company, FGD).

Based on the provided information, the results of this study can be summarized by illustrating the relationship between the variables that affect the four study locations as follows:

Omar Al-Mukhtar Street (OMS): The model in Figure 13 demonstrates the weaknesses in pedestrian facilities, city planning and management, security and safety, and social-cultural interactions. The results confirm that the lack of planning and management of public spaces in the centre of Tripoli has a negative impact on other dimensions of physical activities and social interactions, leading to a decrease in pedestrian numbers on the street. For example, there is a direct relationship between the lack of planning and management and the poor condition of pedestrian facilities. Additionally, the model shows that OMS

possesses aesthetic resources that attract attention, such as historical facades and symbols. According to (Askari, 2014), physical activities and social interactions in public spaces rely on "the invisible aesthetic experience for feeling safe, comfortable, and happy, which makes the public space appealing and inspiring." Therefore, transforming OMS into a pedestrian-friendly street should involve improving its infrastructure, enhancing security and safety, and emphasizing the local administration's importance of increasing comfort on the street, maintaining pedestrian facilities, and diversifying activities.

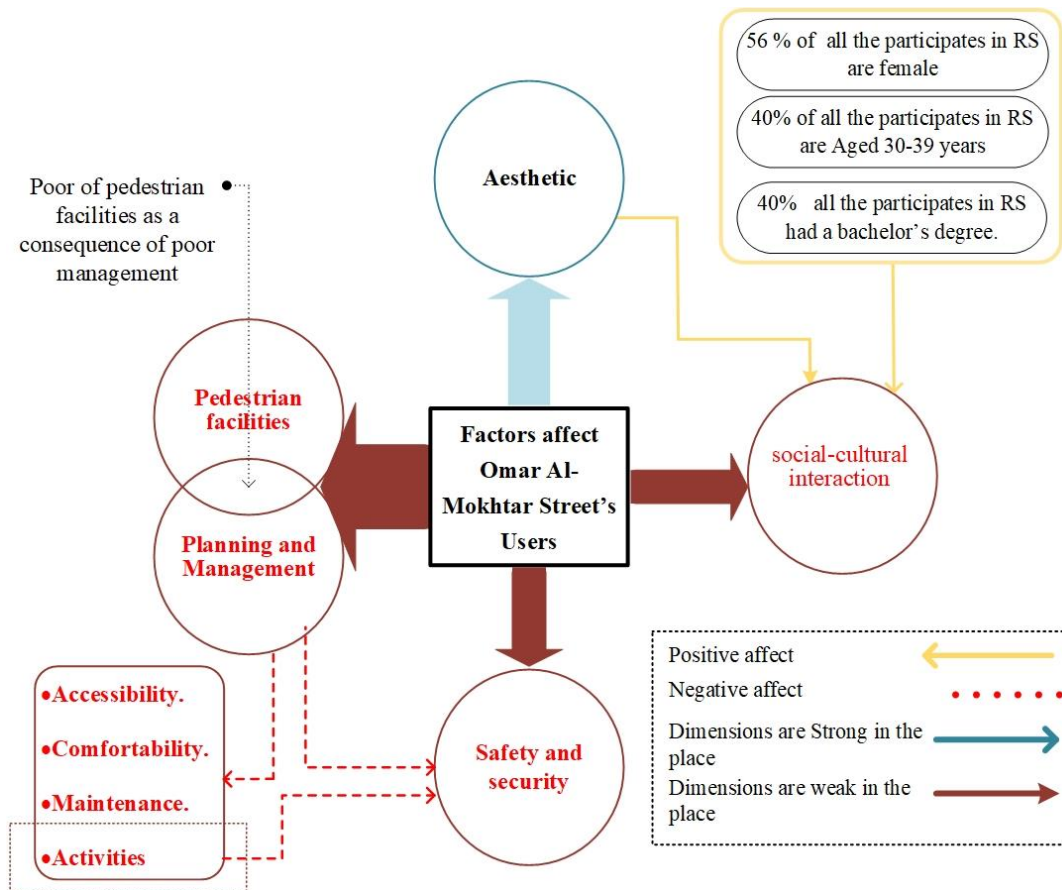


Figure 13. H-POS evaluation model in Omar Al-Mokhtar.

Martyrs Square (MS) is considered one of the most important historical public spaces in Tripoli, located in the heart of the city center. Figure 14 illustrates the deficiencies in pedestrian facilities, city planning and management, security, and safety, which negatively impact pedestrians. Inadequate planning and management in Tripoli have resulted in the lack of pedestrian facilities and their poor maintenance, negatively affecting user comfort. On the other hand, the aesthetics and social-cultural interactions have a positive impact on users, as they express their satisfaction with the limited activities held in Martyrs Square, leading them to spend more time there. This makes it an attractive factor for users who frequent the square and revisit it. One significant result is that the social interactions among users have made Martyrs Square one of the most attractive places for pedestrians. The problem of public transportation in Libya is a general issue, and as shown in Figure 14, the accessibility to and from Martyrs Square negatively affects users. Therefore, improving pedestrian facilities in Martyrs Square comes from the intersection of providing pedestrian facilities with an enhanced performance of local administration in Tripoli, increased security in the city, and an improved public transportation system. The historical significance of Martyrs Square has turned it into a bustling place for users, not only from Tripoli but also from all parts of Libya.

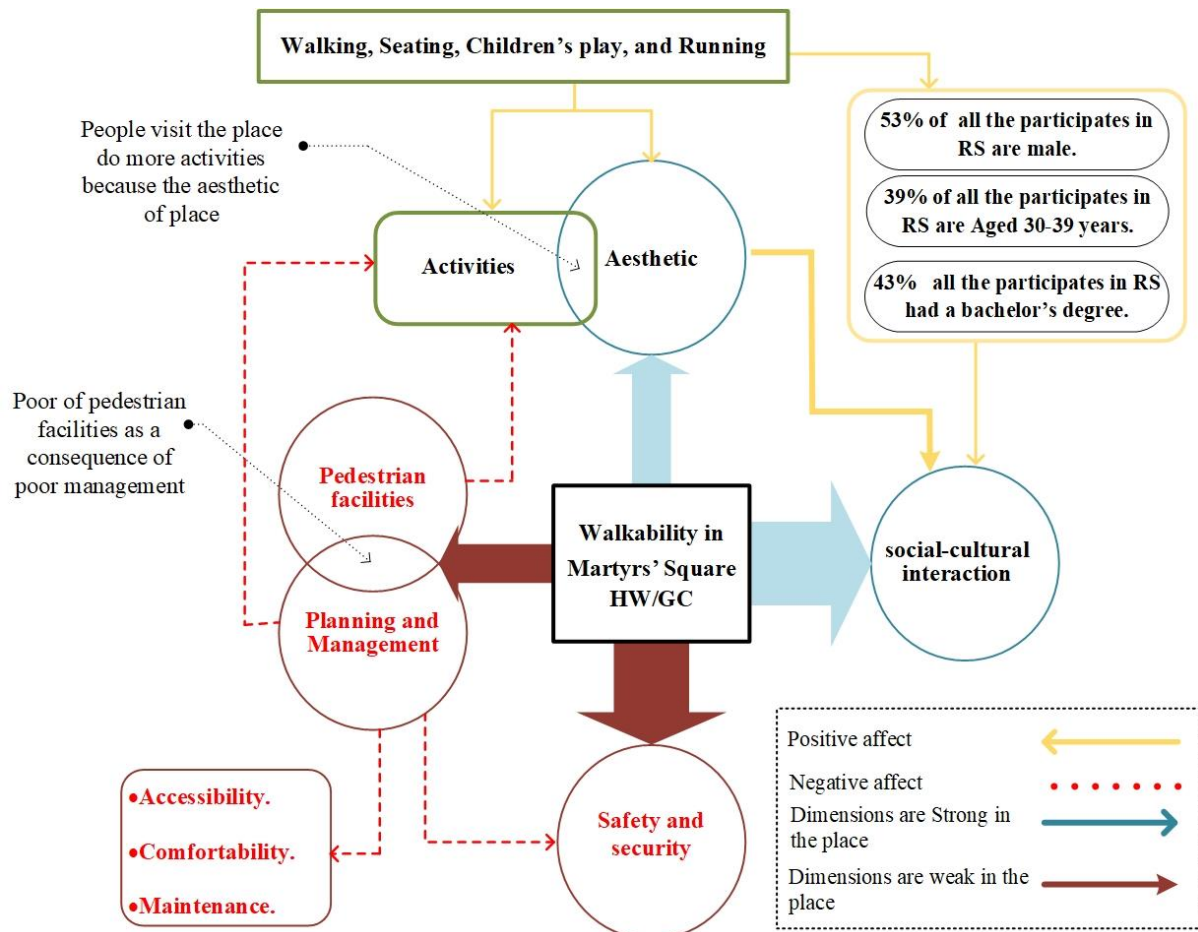


Figure 14. H-POS evaluation model in Martyrs' Square.

Algeria Square (AS) is one of the most important historical squares in Tripoli, as it houses several administrative and religious buildings, such as the municipality and the Jamal Abdul Nasser Mosque. Figure 15 illustrates that the lack of pedestrian facilities and poor management negatively affect pedestrians. Additionally, the absence of amenities, maintenance, and natural landscapes has negative impacts on users who spend extended periods or revisit Algeria Square. The square is considered a safe place, as depicted in Figure 15, and users prefer to frequent it due to the sense of security it provides. As previously mentioned, the Italians constructed Algeria Square to symbolize the beauty of Tripoli, and as such, the aesthetic value of the place has a positive impact on users. Algeria Square is no different from other study locations, and to improve the pedestrian experience in the square, it is necessary to provide public transportation and pedestrian amenities, implement regular maintenance, and offer various social activities.

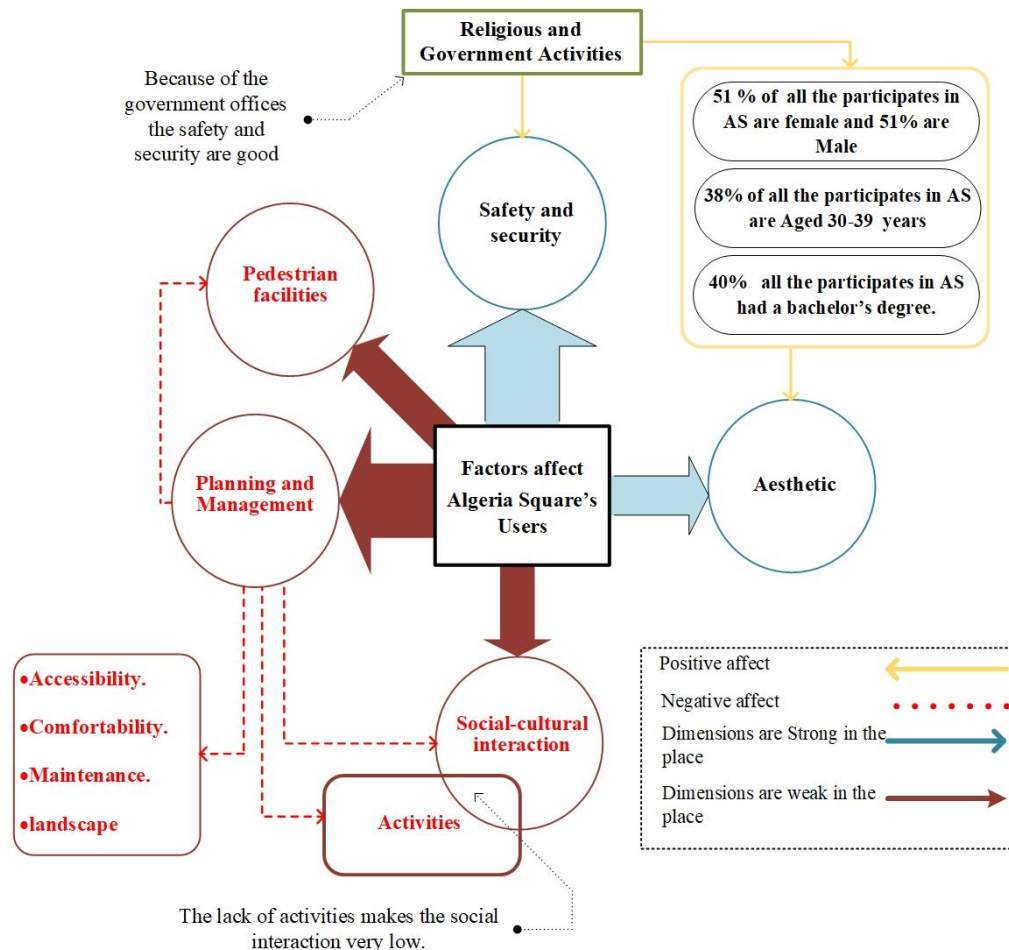


Figure 15. H-POS evaluation model in Algeria Square.

Al-Rashid Street: As depicted in Figure 16, the city's poor planning and management are the cause of the shortcomings in pedestrian facilities, urban planning, and aesthetics, which are evident in the abundance of dirt and a lack of pedestrian facilities. Additionally, using pedestrian crossings as sites to exhibit goods and park cars provides extra barriers for pedestrian passages. According to this study, the supply of pedestrian amenities is hampered by government corruption, poor plan implementation, and an absence of development control. On the other hand, Tripoli's most important business area is Al-Rashid Street. The model demonstrates that despite the unfavourable environmental conditions on Al-Rashid Street, commercial activity benefits pedestrians' sense of security, causing them to visit and stay there. Figure 16 shows that among the four study locations in this paper, Al-Rashid Street has the highest number of users on weekdays and weekends despite having a failing pedestrian infrastructure and pedestrian congestion. This can be linked to the variety of daily activities carried out in this area, including employment and shopping, which are seen to be the most compelling causes luring people to return to the public places in Tripoli's historic centre.

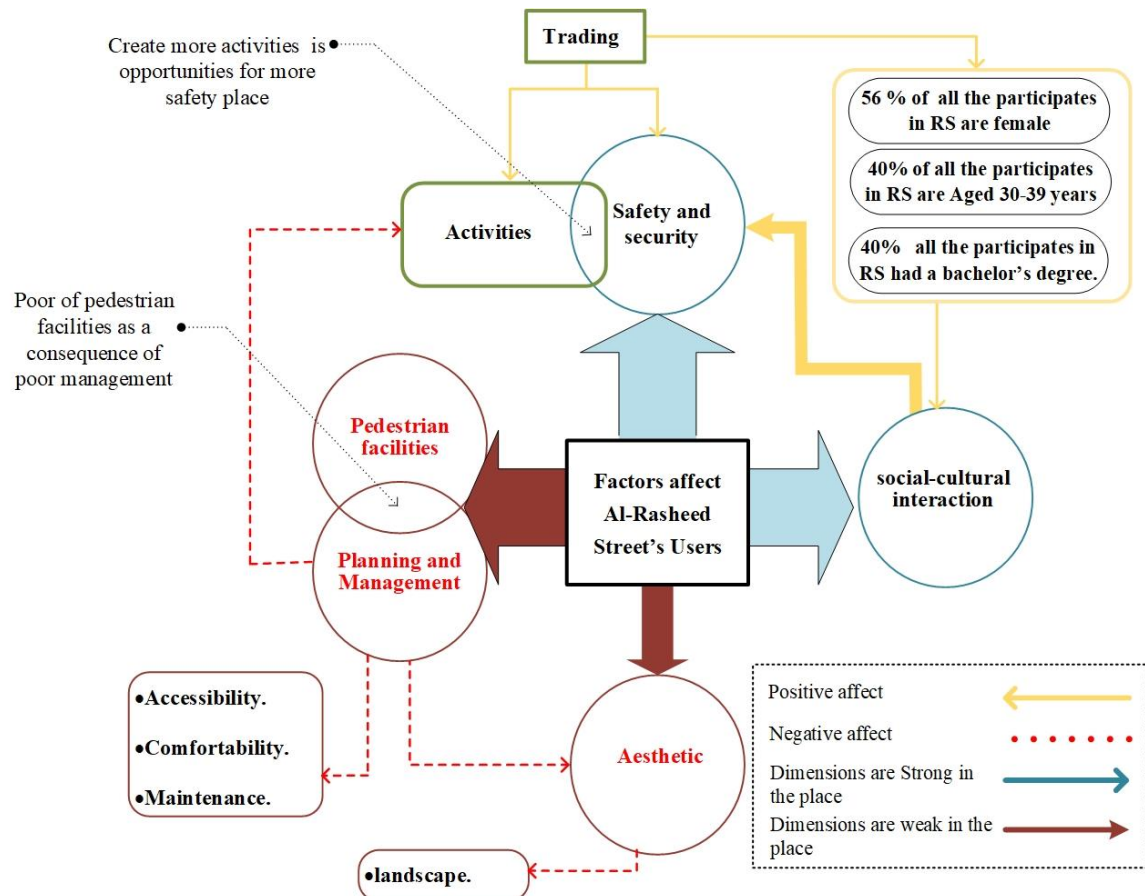


Figure 16. H-POS evaluation model Rasheed Street.

3.5 Building a critical understanding of the barriers impacting the perceptions of public spaces in Tripoli

The findings of this research support Appleyar's (1980) statement, that vibrant and successful public spaces can only be achieved by striking a balance between different user groups and activities. As previously mentioned, local authorities in Tripoli lack an official strategy for public spaces in the city centre, and there is no government management for public spaces. Overall, Tripoli is a city dominated by motorized vehicles, and activities throughout the city are mostly limited to walking to work and carrying out daily tasks like shopping. Obstacles faced by pedestrians in the historical area in Tripoli, such as safety, pedestrian facilities, planning, management, aesthetics, and social culture, discourage people from spending time walking or revisiting H-POSs in Tripoli.

In Tripoli, specific data for assessing the quality of H-POSs regarding safety, security, pedestrian facilities, aesthetics, and social and cultural interaction is not collected. The overall results indicate that age and education are the main social and demographic factors leading people to spend more time in H-POSs in the city centre. On the other hand, from users' perspectives, facilities, safety, and aesthetics are the most significant barriers that limit the possibility of spending extended periods in these spaces. Overall, Tripoli suffers from infrastructure deficiencies, such as a lack of facilities for people with special needs, parking spaces, pedestrian facilities, seating, and shelters. Ewing & Handy (2009) also pointed out that the lack of certain facilities in H-POS hinders physical activity in its simplest form, such as walking, making mobility challenging.

The results of this paper indicate a relationship between the gender of participants in this study and the time spent walking in the study areas. However, gender has no significant relationship with the frequency of revisiting the four study areas, as both genders revisit them to a similar extent. This finding contrasts with Abdulla et al. (2016) study which suggests that gender separation has always been a part of Libyan, Arab-Islamic identity, and traditions, including the use of public spaces. There is a significant relationship between the age of participants the time spent walking in the case study areas and the frequency of revisits. Comparing adults aged 41 to 60 or more, participants aged 18 to 40 spend 60% more time walking. The

participants' education level and the amount of time they spent walking in the model areas are also significantly correlated. Participants with higher education spend more time walking. These results suggest that social and demographic characteristics are closely associated with walking trips.

The capacity and interest of users to travel great distances or spend longer time in Tripoli's H-POS are hampered by a number of barriers. About 60% of the participants estimated these challenges, which include high speeds of traffic near POS, high rates of crime and accidents, a lack of social services, a lack of accessibility for people with disabilities, a lack of urban furniture and amenities (such as seating and dining areas), a lack of connectivity to other parts of Tripoli, and a lack of public transportation options. This section's Principal Component Analysis (PCA) revealed that facilities, safety, and aesthetics are the primary concerns of participants. This shows that consumers' experiences and preferences are highly influenced by the availability and calibre of amenities, as well as by how safe and secure they consider those facilities to be. The analysis of users' needs for visiting POSs found in case study areas that 93% of participants agreed or strongly agreed on the need to increase social activities, 92% agreed or strongly agreed on the need for POSs to encourage people-watching and include fountains, public art, performances, etc., 79% agreed or strongly agreed on the need to make the most of the land that is currently available in H-POSs, and 76% agreed or strongly agreed on the need for POSs to include fountains, public art. According to a PCA analysis of their demands, users in the research settings have needs for physical components, safety and security, and social connection.

4. Conclusions

Cities have increasingly lost their sense of pedestrian culture due to the prevalence of mechanical and vehicle transportation. Urban designers, decision-makers, and professionals, however, continue to emphasise the importance and benefits of walkability as a key factor in the sustainable future of our historic cities, especially considering the challenges of Climate Change. Numerous policies, strategies, guidelines, and specific proposals have been developed and implemented in cities to promote walking as a key means of mobility within the evolving models of walkable cities and 20-minute neighbourhoods. To understand the state of walking in North African cities and their suitability for pedestrian activities, Tripoli was taken as a case study, representing a developing city in North Africa. In this paper, four historical public squares in Tripoli were studied to understand the barriers that hinder Tripoli residents from incorporating walking into their daily routines and reducing reliance on motor vehicles. The main goal of this research is to analyse the barriers and success factors affecting the effective walking experience in the public spaces located in the historical part of Tripoli, Libya. The results of this study support some important recommendations that can be useful in developing Tripoli into a more livable and prosperous city.

The study revealed that the majority of the current public spaces in the historic centre of Tripoli are not suitable to be well-balanced pedestrian-friendly areas. Additionally, Tripoli heavily relies on cars and has an existing infrastructure burdened with traffic congestion and air pollution, lacking adequate and safe pedestrian pathways. As a short-term measure, there is an urgent need to adopt a new policy that prioritizes pedestrians by segregating vehicles from pedestrian pathways. Specifically, dedicating certain streets in the centre of Tripoli exclusively for pedestrians and understanding the needs and reasons behind their preference for walking in public spaces over other options.

Providing clean and well-maintained public spaces makes them more attractive and welcoming to all users, encouraging them to visit and stay for longer periods. Amenities such as seating, public toilets, shelters, and sidewalks can facilitate pedestrian movement during adverse weather conditions. The study also revealed that public transportation is often unavailable and inefficient in Tripoli, leading people to heavily rely on private cars. Therefore, improving the quality and efficiency of public transportation can alleviate traffic congestion and related issues, reducing pressure on the road infrastructure and urban areas in general.

On another note, designing pedestrian-friendly transition areas with a new pavement plan to unify the pavement pattern with the soft landscape is recommended. Renovation and maintenance of buildings in Tripoli's city centre, including providing access for people with disabilities to all H-POSs and other urban elements, are also crucial. In this context, pedestrian-friendliness, safety, and security play important roles

in shaping urban life in H-POS and their surroundings. While the safety infrastructure is an element in security, it does not entirely reflect the potential threats pedestrians face in post-conflict urban areas. The study highlights the absence of police presence and the prevalence of weapons as major threats pedestrians face in public open spaces in post-conflict Tripoli.

Furthermore, the study shows that the livable H-POS are not solely tied to the physical environment but also the safety and security factors. To increase pedestrian safety, adjusting vehicle speed when crossing unprotected roads with median signs, creating pedestrian crossings, installing traffic signals, and regulating all intersections around public spaces and pedestrian crossings are recommended. Additionally, to reduce crime within H-POSs in a city that has faced armed conflict, several measures can be implemented, such as organizing group activities to encourage people to walk together, installing surveillance cameras, and increasing foot patrols by the police.

The city of Tripoli and its H-POSs in the city centre should be able to accommodate various activities, including sitting, dining, shopping, engaging in different activities, and sports. The municipality of Tripoli should diversify activities in historical public open spaces, such as sports, social, religious, and festivals. Similarly, management of POSs should grant equal access rights to all individuals, without discrimination or barriers based on age, gender, or educational level. A master plan and guidelines for historical public spaces should be established, defining relevant types of public open spaces and their associated conditions, along with an integrated and adaptive management plan for individual developments, increasing awareness of the importance of H-POSs among stakeholders. Collaboration between local organizations is essential for the implementation and management of historical public open spaces, including the Libyan Urban Planning Association, urban planning management in municipalities, the National Organization for Information and Documentation, survey management, and remote sensing centres.

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Conflicts of Interest

The Author(s) declare(s) that there is no conflict of interest.

Data availability statement

- Appendix A: Observation Method; <https://doi.org/10.7910/DVN/LUQGNA>
- Appendix B: Users Questionnaire; <https://doi.org/10.7910/DVN/LUQGNA>
- Appendix C: Professionals Questionnaire; <https://doi.org/10.7910/DVN/PIYV29>

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