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Preserving the Past: A Dynamic Analysis of Heritage Tourism and Land Conservation in Mamluk Cairo

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Abstract: Historic urban cities face increasing pressure from tourism, necessitating sophisticated approaches to visitor management that protect both heritage values and local communities. The current study develops new sustainable metrics—sustainable visitor capacity (SVC) and Sustainable Visitation Index (SVI)—to provide a multifaceted assessment of heritage destination management beyond simple visitor volume calculations. The SVC considers operating hours, site capacity, and walking time, while the SVI holistically evaluates time efficiency, spatial distribution, and physical comfort. Applying these metrics to seven routes through the historic Mamluk monuments revealed significant variations in sustainability performance, with SVI scores ranging from 48.9 at Al-Ṣalība/Al-Sayyida Zaynab Streets to 92.8 at Northern Al-Mu'izz Street. The findings demonstrate that while the recommended daily visitor capacity ranges from 1286 to 2182 visitors across different routes, actual visitation frequently exceeds these thresholds, particularly in commercial zones. Geographic analyses and on-site studies identified the integration of tourist activities with commercial, residential, and religious uses as a critical factor contributing to overcrowding, especially evident in areas like Al-Ṣal¯ıba Street, where low SVI scores reflect challenges with unorganized markets and local congestion. The study offers site-specific recommendations for heritage managers, focusing on dynamic visitor management systems and zoning strategies that consider the dual function of these historic corridors as both tourist attractions and vital local thoroughfares. This research provides heritage managers with practical tools to quantify and enhance the sustainability of visitor experiences while preserving site integrity within complex urban heritage contexts.

Keywords: sustainable heritage tourism; visitor capacity management; visitor experience assessment; Mamluk monuments; urban heritage sites

Academic Editor: Fulong Chen

Received: 4 December 2024
Revised: 1 January 2025
Accepted: 12 January 2025
Published: 15 January 2025

Citation: Salem, A.E.; Eissa, A.T.; Hassan, T.H.; Saleh, M.I. Preserving the Past: A Dynamic Analysis of Heritage Tourism and Land Conservation in Mamluk Cairo. *Heritage* **2025**, *8*, 30. https://doi.org/10.3390/heritage8010030

1. Introduction

The cultural heritage sustainability of historical sites has become an increasingly global concern as tourism continues to grow at elevated rates [1]. Many iconic historic landscapes and landmarks face challenges while accommodating visitors in safeguarding the heritage destinations' cultural and architectural integrity [2]. Sustainable management of cultural heritage sites requires multifaceted strategies that consider the complex interplay between visitor access, environmental impact, and long-term preservation [3]. The sustainability of cultural landscapes, especially those with significant historical and architectural value, is

a complex issue that extends beyond the physical attributes of the sites themselves. The relationship between overcrowding, overtourism, and the long-term preservation of these landscapes is a critical area of study [4].

Existing research has highlighted the need for a more holistic understanding of the factors that contribute to sustainable land use, with a particular focus on cultural and historical sites that face the challenge of balancing visitor access and environmental stewardship [5]. Heritage sustainability management studies have identified various interconnected factors that significantly influence the sustainability of both natural and built environments, particularly in the context of cultural heritage sites [1,2]. These include the total path length within a site, which can impact visitor flow and carrying capacity [5]—longer, meandering paths may increase dwell time and congestion. At the same time, shorter, more direct routes could facilitate quicker turnover but potentially diminish the overall visitor experience [6]. The average walking speed of tourists is another critical factor, as faster-paced visitors tend to disperse more quickly than those who stroll at a leisurely pace [7].

Similarly, the average visit time and inter-site travel time between different monuments or attractions can influence how visitors move through and experience the area, with sites hosting visitors who linger for extended periods potentially reaching capacity limits more quickly than those with higher throughput [8]. Factors like path width and comfort, such as the availability of shaded rest areas or seating, can also impact the overall carrying capacity by affecting the ease and enjoyment of the visitor experience [6]. The maximum capacity per site, accounting for safety regulations and structural limits, is a critical sustainability metric that must be carefully monitored and managed [4]. Seasonal variation in visitor numbers, driven by weather, school holidays, and cultural events, can also significantly impact the sustainable visitor capacity of a site. Finally, considering the effects of visitor activities on the natural and built environments, the environmental impact factor is crucial for preserving the ecological integrity of cultural heritage landscapes [9].

Thus, existing research on the sustainability of cultural heritage sites has explored a range of factors that influence carrying capacity and ecological health, including total path length, average walking speed, average visit time, inter-site travel time, path width, comfort factor, maximum capacity per site [10], peak hours factor [11], seasonal variation factor, and environmental impact factor. While existing research has examined various aspects of heritage site management, including visitor flow patterns and carrying capacity metrics, there remains a critical gap in developing integrated assessment tools that simultaneously consider spatial, temporal, and comfort dimensions. This gap is particularly evident in complex historical urban landscapes like Mamluk Cairo, where the dense concentration of the Mamluk monuments presents unique challenges in balancing preservation with accessibility. Although individual factors such as path length, walking speed, and maximum site capacity have been studied separately, the field lacks a comprehensive framework that synthesizes these elements into cohesive sustainable visitor capacity (SVC) and Sustainable Visitation Index (SVI) indicators. Such indicators are essential for addressing the multifaceted challenges of heritage site management, especially in historically significant urban areas where traditional carrying capacity metrics alone may not adequately capture the nuances of sustainable tourism management.

In areas with high visitation, such as Mamluk Cairo, understanding the visitor flow dynamics, visitation time, and resource utilization is crucial for developing effective strategies to mitigate overcrowding and degradation [9]. The case of Mamluk-era monuments and historic quarters attracts thousands of visitors each year [9]. Despite extensive research on visitor dynamics, a comprehensive framework integrating spatial, temporal, and comfort factors in heritage sites is still lacking. This study aims to address the gap in the comprehensive analysis of these heritage sustainability factors and their impact on

the sustainability of Old Cairo's Mamluk monuments. By applying a holistic approach to evaluating visitor dynamics and their effects on the historic landscape, the research will provide critical insights to inform sustainable management strategies and ensure the long-term preservation of these cultural treasures. Therefore, the study aims to answer the following research questions:

- RQ1: What are the current visitor dynamics in Old Cairo's Mamluk monuments, including total path length, average walking speed, average visit time, inter-site travel time, path width, comfort factor, maximum capacity per site, peak hours factor, seasonal variation factor, and environmental impact factor?
- RQ2: What strategies can tourism routes implement to ensure the long-term preservation of Old Cairo's Mamluk monuments while enhancing the visitor experience and promoting sustainable tourism?

By addressing these questions, this study will contribute to the broader understanding of sustainable heritage management and provide practical recommendations for policymakers, urban planners, and site managers in Old Cairo's Mamluk monuments and similar cultural destinations worldwide.

2. Literature Review

2.1. The Sustainability of Lands and the Impacts of Overtourism

Historical land sustainability has become an increasing concern as these landscapes are often filled with deep cultural significance and architectural heritage. It faces the dual challenge of accommodating growing visitor numbers while preserving its ecological, social, and environmental integrity [6]. Cultural heritage sites serve as powerful magnets for tourists, offering unique experiences and insights into the past [12]. However, the dramatic increase in visitors can also lead to significant environmental degradation, social disruption, and the potential loss of the very attributes that draw people to these places in the first place because of overtourism. Overtourism, defined as the excessive and unmanaged growth of visitor numbers in a destination, has emerged as a critical challenge facing many iconic cultural landscapes worldwide [13]. The literature on the impacts of overtourism has highlighted myriad ways in which unchecked visitor numbers can undermine the sustainability of cultural and historical sites [14].

The consequences of overtourism can be far-reaching and long-lasting, from physical damage to historic structures and landscapes to the displacement of local communities according to Mandić et al. [15] and de Quadros et al. [16] research. Furthermore, the environmental impact of mass tourism, including increased waste, pollution, and resource depletion, can severely compromise the ecological health of these sensitive areas [13]. Land, heritage, tourism, and sustainability scholars have emphasized the need for a comprehensive, holistic approach to managing the sustainability of cultural heritage sites, one that goes beyond the traditional focus on conservation and instead considers the complex interplay between visitor access, environmental impact, and socioeconomic factors [9]. This approach requires a deep understanding of each site's unique characteristics and carrying capacities and the development of tailored route strategies that balance the needs of tourists, local communities, and the preservation of cultural and natural resources [14].

2.2. Heritage Conservation and the Limits of Visitor Capacity in Historic Sites

The preservation and conservation of cultural heritage sites have long been a central concern for policymakers, urban planners, and heritage professionals [9]. The literature in this field has explored various frameworks for physical, social, and intangible safeguarding to ensure their long-term viability and accessibility for future generations. One of the critical challenges in heritage conservation is managing the balance between visitor access

and preserving the site's integrity [17]. Historic sites often attract large numbers of visitors, by their very nature, drawn by the opportunity to experience the tangible appearances of the past [6]. However, this rise in the number of people visiting can also pose significant risks to the site's physical fabric and the overall visitor experience and quality of life for local residents [6,9,14]. Visitor capacity, or the maximum number of people a site can accommodate without compromising its conservation or the visitor experience, has been a central focus of the heritage management literature [9]. Researchers have explored a variety of factors that contribute to determining visitor capacity, including physical constraints, environmental sensitivity, social and cultural considerations, and the site's ability to absorb and manage visitor flows [18].

Previous literature has also highlighted the challenges of implementing and enforcing visitor capacity limits, particularly in the face of growing tourism demand and the commercial pressures often accompanying it [2]. Strategies such as timed ticketing, visitor distribution, and developing alternative access points have been explored as potential solutions, but their effectiveness has been critical and often context-dependent [19]. Furthermore, previous studies have emphasized the need to consider visitor capacity management's broader social and economic impacts, particularly on local communities [20]. The visitation numbers of the carrying capacity index impact residents' displacement, the historic neighborhoods gentrification, and the loss of traditional livelihoods' potential. These issues must be carefully navigated to pursue sustainable heritage conservation [21].

2.3. Key Factors Influencing Sustainable Visitor Dynamics

The sustainable visitor dynamics in cultural heritage sites have highlighted a complex interplay of variables that jointly determine the carrying capacity of heritage historical sites. Understanding the interconnection of these factors is crucial for developing effective management strategies that balance visitor access with long-term preservation. One of the critical factors that has received significant attention is the total path length within a cultural heritage site. For instance, Bohannon and Andrews (2011) have found that the length and configuration of visitor paths can significantly impact the flow of people, the distribution of residence time, and the overall carrying capacity of the site. Longer paths may lead to increased congestion and localized overcrowding, while shorter, more direct routes can facilitate quicker turnover but potentially diminish the overall visitor experience [2].

Moreover, tourists' average walking speed directly impacts visitors' dispersal throughout the site. Faster-paced visitors tend to move through the site more quickly, reducing the risk of localized bottlenecks and overcrowding, while slower-moving visitors may contribute to the accumulation of people in certain areas [22]. Understanding and accounting for variations in walking speed, which can be influenced by factors such as age, fitness level, and cultural background, can help site managers develop more effective visitor flow management strategies [23]. Additionally, the average visit time of tourists is also a significant factor that determines the sustainable carrying capacity of a cultural heritage site. Sites that attract visitors who stay for extended periods may reach their capacity limits more quickly than those with a higher throughput of shorter visits [7].

Thus, the inter-site travel time between different monuments or attractions within a larger cultural landscape is also crucial to sustainable visitor dynamics. The ease and efficiency with which visitors can move between the various elements of a site can significantly impact the overall distribution of people and the potential for localized overcrowding [2]. For instance, the availability and quality of transportation options, the distance between sites, and the wayfinding cues provided to visitors all shape this inter-site travel time [24]. In this vein, the width of visitor paths and the availability of comfortable rest areas, or the "comfort factor", are also essential considerations in the pursuit of sustainable visitor

management [25]. Narrow paths and a lack of shaded seating or other amenities can contribute to visitor fatigue and discomfort, reducing dwell time, increasing congestion, and a less enjoyable overall experience [26].

Considering factors such as safety regulations, structural load limits, and environmental sensitivities, the maximum capacity per site is a critical sustainability metric that must be carefully monitored and managed [25]. Exceeding these limits can not only compromise the physical integrity of the site but also undermine the quality of the visitor experience and the long-term preservation of the cultural and natural resources [27]. Seasonal variation in visitor numbers, driven by weather, school holidays, and cultural events, can also significantly impact the sustainable visitor capacity of a site. Understanding these seasonal fluctuations and developing strategies to manage them, such as the implementation of timed ticketing or the temporary closure of specific areas, is essential for maintaining the overall health and stability of the cultural heritage landscape [28]. Thus, studying the factors influencing sustainable visitor dynamics will enhance the sustainability standard, especially in heritage contexts.

While the existing literature has extensively documented individual factors affecting visitor dynamics [22,23,25], there remains a critical gap in understanding how these factors interact specifically within complex historical Islamic urban contexts like Old Cairo. Previous studies have largely focused on isolated aspects such as walking speeds [22], path configurations [26], or carrying capacities [27] in more linear or conventional heritage sites. However, the unique characteristics of Old Cairo's Mamluk monuments—with their intricate network of paths, multiple entry points, and dual function as both tourist attractions and active religious sites—demand a more urbane analytical framework.

2.4. Study Context: Mamluk Monuments in the Historic District of Old Cairo

While extensive research exists on heritage site management and sustainable tourism [1–3], the current literature reveals significant gaps in addressing the unique challenges faced by Old Cairo's Mamluk monuments. Previous studies have focused mainly on isolated factors such as carrying capacity or visitor flow patterns [4,5]. Still, few have attempted to develop integrated, multi-factor sustainability indicators that consider the distinctive characteristics of Islamic architectural heritage and medieval urban planning [29,30]. The complex network of narrow streets, interconnected monuments, and dense urban fabric in Old Cairo's Mamluk monuments presents unique challenges that conventional tourism management frameworks fail to address [17,31]. For instance, while annual visitor numbers to Old Cairo's Mamluk monuments have passed thousands of visitors in recent years, existing research has not adequately examined how this volume interacts with the district's distinctive spatial configuration, where monuments are often separated by winding alleyways and commercial zones [9]. The traditional metrics used in heritage tourism studies, such as simple carrying capacity calculations or linear path analyses [8,25], prove insufficient for understanding visitor dynamics in Old Cairo's Mamluk monuments organic urban structure, where 25 major Mamluk monuments are distributed across nine distinct historical zones [29]. Each zone presents its microenvironment of visitor patterns, local community interactions, and preservation challenges [13,14]. Furthermore, while previous studies have explored general principles of sustainable tourism [6,7], they have not adequately addressed the specific socio-cultural context of Islamic heritage sites, where religious use, tourist visitation, and local commercial activities create a complex web of sometimes competing demands on the space [9,11]. This gap is particularly evident in the limited research on how traditional sustainability indicators might need to be modified to account for the dual role of many Mamluk monuments as both tourist attractions and

active religious sites, a characteristic that significantly impacts their carrying capacity and management requirements [9,20,21].

The study focuses on the Mamluk monuments in the historic district of Cairo, Egypt, a region renowned for its rich concentration of architectural and cultural heritage that has attracted visitors worldwide for centuries. The selected sites for this research include 25 significant Mamluk-era monuments, such as mosques, madrasas, palaces, and other historic structures dating back to the 13th–15th centuries. The Mamluk monuments of Old Cairo represent a masterful example of medieval urban planning, with distinct areas serving different functions while maintaining a cohesive architectural and social fabric. These nine areas, each with a unique character and purpose, demonstrate sophisticated approaches to sustainable urban development that continue to offer valuable lessons for modern city planning [29–31].

In the Northern Quarter (Area 1), the Al-Aqmar Mosque stands as a pioneering example of the Fatimid-Mamluk architectural transition, featuring innovative facade treatments and sustainable water management systems. Alongside it, the Al-Ṣāliḥ Ṭalā'iʿ Mosque showcases advanced hydraulic engineering. At the same time, the Palace of Baštāk exemplifies climate-responsive architecture with its traditional cooling systems, setting standards for environmental adaptation in urban settings. The Central Religious Complex (Area 2) centers around the magnificent Mosque of Al-Mū'ayyad Šayḫ, a major religious center demonstrating integrated social functions. The adjacent Bīmāristān of Al-Mū'ayyad Šayḫ represented a revolutionary approach to healthcare architecture, while the Madrasa of Qānṣūh Al-Ġawrī exemplified efficient space utilization and natural ventilation systems. This concentration of public institutions created a sustainable community hub that served multiple social needs.

Moving to the Eastern Educational District (Area 3), the cluster of madrasas, including those of Al-Ašraf Barsbāy, Īnāl, and Qāytbāy, showcases sophisticated approaches to educational architecture. These structures demonstrate advanced water management, natural lighting solutions, and sustainable material use, creating an environment conducive to learning while minimizing environmental impact. The Western Residential Zone (Area 4) presents excellent examples of domestic architecture through the House of Al-Razzāz and the House of Al-Ašraf Qāytbāy. These residences and the palace of Ṭāẓ demonstrate how private spaces could be designed to maximize comfort while minimizing resource consumption through innovative cooling systems and thoughtful urban adaptation. The Commercial District (Area 5) centered around the Complex of Qiğmās Al-Isḥāqī represents a sophisticated approach to mixed-use development. The Maqʿads of Māmāy Al-Sayfī and Qānṣūh Al-Ġawrī showcase how commercial spaces could be integrated into the urban fabric while maintaining sustainable practices and social harmony.

The Educational Corridor (Area 6) features a concentration of madrasas, including those of Abū-Bakr Muzhar, Miṭqāl Al-Anūkī, and Ǧamāl al-Dīn Al-Ustādār. These institutions demonstrate sophisticated approaches to educational space planning, incorporating natural ventilation and lighting solutions that create optimal learning environments while minimizing resource consumption. The Religious Quarter (Area 7) encompasses several important mosques, including Al-Afḫar Mosque and the Mosque of Manğak Al-Silaḥdār. These structures showcase advanced water conservation systems, acoustic design, and efficient space utilization, demonstrating how religious architecture could sustainably serve both spiritual and practical community needs. The Institutional Zone (Area 8) contains significant educational and religious establishments, including the Madrasa of Qānṭbāy Al-Rammāḥ and the ḫānqāh of Al-Ašraf Barsbāy. These buildings exemplify sophisticated approaches to institutional architecture, incorporating sustainable design features that facilitate their primary functions while maintaining environmental responsibility. Finally,

the Administrative District (Area 9), anchored by the Maqʿad of Al-Ašraf Qāytbāy, represents the culmination of Mamluk administrative architecture. These areas demonstrate how governance structures could be integrated into the urban fabric while maintaining sustainable design principles and efficient resource management [29]. In this vein, the study proposes the following:

1. The sustainability of Old Cairo's Mamluk monuments is significantly impacted by the intricate interplay of key factors, including total path length, average walking speed, average visit time, inter-site travel time, path width, comfort factor, maximum capacity per site, peak hours factor, seasonal variation factor, and environmental impact factor. A comprehensive analysis of these factors and their relationships can provide valuable insights into the carrying capacity and overall ecological health of the Mamluk monuments, informing sustainable management strategies for preserving these cultural treasures;
2. Developing and implementing sustainable route management strategies that address the identified factors can enhance the visitor experience, promote long-term preservation, and ensure the ecological integrity of Old Cairo's Mamluk monuments. These strategies should consider the site's unique characteristics and constraints, as well as the needs and expectations of both tourists and local communities, to strike a delicate balance between accessibility and conservation.

3. Materials and Methods

3.1. Data Collection and Analysis Approach

To evaluate the heritage routes' sustainability of the Mamluk monuments in Old Mamluk Cairo, this study employs a mixed-method approach that combines the analysis of geographic data and on-site observations. Cairo, the busy capital of Egypt, is a very popular place for tourists, with millions of people visiting every year. In 2023, according to Statista [32], a record 14.9 million tourists came to Egypt, which is very important for the country's economy. Cairo receives a significant number of tourists due to its rich cultural heritage and numerous historical attractions. Thus, studying the context of Mamluk Cairo and how to make it sustainable is crucial because it is one of the most crowded tourist destinations in Cairo.

Using Google Earth's high-resolution satellite imagery and geographic data tools, the research team measures and analyzes key factors that influence sustainable visitor dynamics, including total path length, average walking speed, average visit time, inter-site travel time, and path width [33]. The total path length within the monument sites and surrounding areas provides insights into the overall visitor circulation and the potential for congestion, as longer, more meandering paths may lead to increased dwell time and localized overcrowding. At the same time, shorter, more direct routes could facilitate quicker turnover but potentially diminish the overall visitor experience.

The average walking speed of visitors calculated based on observed behavior sheds light on the dispersal of people throughout the sites, as faster-paced visitors tend to move through more quickly than those who stroll at a leisurely pace. The average visit time, or the amount of time visitors spend at each monument site, is another crucial factor that can impact the sustainable carrying capacity of the area. Sites that attract visitors who stay for extended periods may reach their capacity limits more quickly than those with a higher throughput of shorter visits. The inter-site travel time, or the time it takes for visitors to move between the different monuments within Old Cairo's Mamluk monuments districts, can also influence the overall distribution of people and the potential for localized overcrowding.

The peak hours factor, which examines the variation in visitor numbers throughout the day, and the seasonal variation factor, which explores the fluctuations in visitor numbers due to weather patterns, school holidays, and cultural events, will provide valuable insights into the dynamic nature of visitor flows and the need for adaptive management strategies [34]. In addition to the geographic data analysis, the research team conducted on-site observations and data collection to gather information on the comfort factor, maximum capacity per site, peak hours factor, seasonal variation factor, and environmental impact factor [35]. The comfort factor, which considers the availability of amenities such as shaded rest areas and seating, can influence visitor dwell time and the overall quality of the experience. Considering factors like fire safety regulations and structural load limits, the maximum capacity per site is a critical sustainability metric that must be carefully monitored and managed (see Table 1).

3.2. Sustainable Visitor Capacity and Index Modeling and Analysis

The collected data were organized and analyzed using Microsoft Excel to identify patterns, trends, and relationships between the factors influencing sustainable visitor dynamics. We calculated two key metrics to assess the sustainable carrying capacity of the Mamluk monuments: The sustainable visitor capacity (SVC) and the (SVI). The sustainable visitor capacity (SVC) estimates the maximum number of visitors the sites can accommodate without compromising cultural, environmental, and social sustainability. This metric is calculated based on a weighted formula that considers factors such as total path length, average walking speed, maximum capacity per site, and environmental impact [27]. The Sustainable Visitation Index (SVI), on the other hand, provides a holistic assessment of the sustainability of the visitor experience. This composite score considers factors like average visit time, comfort, and peak hours, reflecting the overall quality and sustainability of the visitor experience. The SVC was calculated using the following formula: SVC = (Operating Hours $\times$ Site Capacity)/(Total Route Time), where operating hours were set at 480 min (8 h), site capacity was estimated at 50 visitors per site, and total route time combined both walking and visit durations (see Table 2).

The calculation metrics for the sustainable visitor capacity (SVC) (Table 3) and Sustainable Visitation Index (SVI) were established based on multiple empirical and theoretical frameworks in cultural heritage management and sustainable tourism. The operating hours (8 h) were set according to standard monument visiting hours in Cairo. At the same time, the site capacity of 50 visitors was determined based on the spatial constraints of the traditional Mamluk architectural spaces pilot study on site by researchers. The walking times and distances were measured using Google Earth data and verified through field observations, considering average walking speeds in historic urban contexts (approximately 4 km/h). The visit duration for each monument (15 min) was established through pilot studies and visitor behavior analysis at similar heritage sites. The weighting factors in the SVI calculation (0.4 for time efficiency, 0.3 for site distribution, and 0.3 for comfort factor) were determined through expert consultations and comparative analysis of visitor management systems in similar historic districts worldwide.

Table 1. Hanging routes planning of the Mamluk archeology sites in Cairo.

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
1	*Northern Al-Mu'izz Street*	The Madrasa of Al-Ašraf Barsbāy	175	Religious (Madrasa)	30°02′59″ N 31°15′41″ E				Start point
		The Palace of Baštāk	34	Domestic (Palace)	30°03′02″ N 31°15′44″ E	150 m	2 min	15 min	https://www.google.com/maps/dir/%D8%B4%D8%B1%DA%A9%D8%AA+%D8%B5%D8%AC+%D8%B2%D8%A7%DB%8C%D8%B2+%D8%A7%D9%84%D9%86%D8%AD%D8%A7%D8%B3,+El-Gamaleya,+El+Gamaliya,+Cairo+Governorate+4331401%E2%80%AD%E2%80%AD/8-2+Darb+Kormoz,+El-Gamaleya,+El+Gamaliya,+Cairo+Governorate/@30.0501601,31.2603266,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x1458409fca5eb011:0x88f5c269e88152a1!2m2!1d31.2613151!2d30.0498217!1m5!1m1!1s0x1458409e251e9077:0xf4ad888c84b0d18e!2m2!1d31.2619892!2d30.0506423!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
		Al-Aqmar Mosque	33	Religious (Mosque)	30°03′05″ N 31°15′42″ E	160 m	2 min	15 min	https://www.google.com/maps/dir/30%C2%B003'02%22N+31%C2%B015'44%22E/30%C2%B003'05%22N+31%C2%B015'42%22E/@30.0508938,31.2603373,363m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2622222!2d30.0505556!1m3!2m2!1d31.2616667!2d30.0513889!3e2?entry=ttu (accessed on 7 January 2025)
		The Madrasa of Abū-Bakr Muzhar	49	Religious (Madrasa)	30°03′05″ N 31°15′47″ E	130 m	2 min	15 min	https://www.google.com/maps/dir/106+Haret+Al+Qasabi,+El-Gamaleya,+El+Gamaliya,+Cairo+Governorate+4331164%E5%9F%83%E5%8F%8A/%D8%AE%D8%A7%D9%86%D9%82%D8%A7%D9%87+%D8%B3%D8%B9%D9%8A%D8%AF+%D8%A7%D9%84%D8%B3%D8%B9%D8%AF%D8%A7%D8%A1,+3727+F7M,+El-Gamaleya,+El+Gamaliya,+Cairo+Governorate+4331404%E5%9F%83%E5%8F%8A%E2%80%AD/@30.0514891,31.2600037,928m/data=!3m2!1e3!4b1!4m14!4m13!1m5!1m1!1s0x1458409e16b79c1d:0x2412ad7c4a4532b6!2m2!1d31.2616434!2d30.0515054!1m5!1m1!1s0x14583f738f42ce69:0x8754ea78871109c8!2m2!1d31.2631764!2d30.051222!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
	Total Route					440 m	6 min	45 min	https://www.google.com/maps/dir/30%C2%B002'59%22N+31%C2%B015'41%22E/30%C2%B003'02%22N+31%C2%B015'44%22E/30%C2%B003'05%22N+31%C2%B015'42%22E/30%C2%B003'05%22N+31%C2%B015'47%22E/@30.0510001,31.2605104,363m/data=!3m1!1e3!4m18!4m17!1m3!2m2!1d31.2613889!2d30.0497222!1m3!2m2!1d31.2622222!2d30.0505556!1m3!2m2!1d31.2616667!2d30.0513889!1m3!2m2!1d31.2630556!2d30.0513889!3e2?entry=ttu (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
2	*Al-Ǧammāliya Street*	The Madrasa of Ǧamāl al-Dīn Al-Ustādār	35	Religious (Madrasa)	30°03′03″ N 31°15′46″ E				Start point
		The Madrasa of Miṭqāl Al-Anūkī	45	Religious (Madrasa)	30°03′01″ N 31°15′45″ E	88 m	1 min	15	https://www.google.com/maps/dir/30%C2%B003′03%22N+31%C2%B015′46%22E/30%C2%B003′01%22N+31%C2%B015′45%22E/@30.0504932,31.2611371,385m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2627778!2d30.0508333!1m3!2m2!1d31.2625!2d30.0502778!3e2?entry=ttu (accessed on 7 January 2025)
		The Maq'ad of Māmāy Al-Sayfī	51	Domestic (Loggia)	30.049255425002606, 31.262171845025605	105 m	2 min	15	https://www.google.com/maps/place/%D9%85%D9%82%D8%B9%D8%AF+%D8%A7%D9%84%D8%A3%D9%85%D9%8A%D8%B1+%D9%85%D8%A7%D9%85%D8%A7%D9%8A+%D8%A7%D9%84%D8%B3%D9%8A%D9%81%D9%8A%E2%80%AD/@30.0498701,31.2614264,165m/data=!3m1!1e3!4m21!1m14!4m13!1m5!1m1!2s30.049289162860738,+31.262149920741937!2m2!1d31.2621499!2d30.0492892!1m5!1m1!2zMzDCsDAzJzAxIk4gMzHCsDE1JzQ1IkU!2m2!1d31.2625!2d30.0502778!3e2!3m5!1s0x145841e1a0eee057:0x90049611c9e44ddb!8m2!3d30.049217!4d31.2621598!16s/g/11h64qg0gw?entry=ttu (accessed on 7 January 2025)
	Total Route					193 m	3 min	30 min	https://www.google.com/maps/dir/Agency+bazriea%D8%8C+3727+85H%D8%8C+%D8%AD%D8%A7%D8%B1%D8%A9+%D8%A7%D9%84%D9%82%D8%B5%D8%A7%D8%B5%D9%8A%D9%86%D8%8C+%D8%A7%D9%84%D8%AC%D9%85%D8%A7%D9%84%D9%8A%D8%A9%D8%8C+%D9%82%D8%B3%D9%85+%D8%A7%D9%84%D8%AC%D9%85%D8%A7%D9%84%D9%8A%D8%A9%D8%8C,+El+Gamaliya,+Cairo+Governorate%E5%9F%83%E5%8F%8A%E2%80%AD/3-7+Haret+Qard,+El-Gamaleya,+El+Gamaliya,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/%D8%B4%D8%B1%D9%83%D8%A9+%D8%A7%D9%84%D8%AC%D8%B2%D8%A7%D8%B1%D8%8C+2+%D9%85%D9%8A%D8%AF%D8%A7%D9%86+%D8%A8%D9%8A%D8%AA+%D8%A7%D9%84%D9%82%D8%A7%D8%B6%D9%89%D8%8C+%D8%A3%D9%85%D8%A7%D9%85+%D9%82%D8%B3%D9%85+%D8%A7%D9%84%D8%AC%D9%85%D8%A7%D9%84%D9%8A%D8%A9+%D8%A7%D9%84%D9%82%D8%AF%D9%8A%D9%85,+Cairo+Governorate%E5%9F%83%E5%8F%8A%E2%80%AD/@30.0501174,31.2616047,464m/data=!3m1!1e3!4m20!4m19!1m5!1m1!1s0x14583f3f5cfba0dd:0x3da0d80b05983859!2m2!1d31.2629844!2d30.0508203!1m5!1m1!1s0x1458409e2915eb0d:0xe51d896d5a1ed9a6!2m2!1d31.2623503!2d30.0501243!1m5!1m1!1s0x1458409fd3c97403:0x78661db62a207eae!2m2!1d31.2621253!2d30.0494479!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
		The Madrasa of Qānṣūh Al-Ġawrī	189	Religious (Madrasa)	30.04607162708943, 31.259669171588037				Start point
		The Maq'ad of Qānṣūh Al-Ġawrī	67	Domestic (Loggia)	30.04607162707633, 31.26008942850475	140 m	2 min	15	https://www.google.com/maps/dir/1+Al+Sharabi,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/%D9%82%D8%B5%D8%B1+%D8%B3%D9%8A%D8%AF%D8%B1%D8%A7,+Al+Motaz+Ldin+Allah%D8%8C+%D8%A7%D9%84%D9%81%D8%A7%D8%B7%D9%85%D9%8A+%D8%A7%D9%84%D8%A3%D8%B2%D9%87%D8%B1,+El+Gamaliya,+Cairo+Governorate+4291046%E5%9F%83%E5%8F%8A%E2%80%AD/@30.0457271,31.2591184,232m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x145840a1b16645c1:0xa76768bb92169a62!2m2!1d31.2593517!2d30.0461899!1m5!1m1!1s0x145840a1ad465207:0x86359101dd2428c!2m2!1d31.2596678!2d30.045823!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
3	*Southern Al-Mu'izz Street*	Al-Afẖar Mosque	109	Religious (Mosque)	30°02′40″ N 31°15′32″ E	400 m	4 min	15	https://www.google.com/maps/dir/Al+Ghuri+Dome,+27W6+C2H,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293020%E5%9F%83%E5%8F%8A/Al-Fakahany+Mosque,+Haret+Al+Akadeya,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293003%E5%9F%83%E5%8F%8A/@30.0459217,31.2584429,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x14584173fb938fb3:0x9bdfcf287e66e8f5!2m2!1d31.2601092!2d30.0460609!1m5!1m1!1s0x145840a1175b2bef:0xf83decb6ece159dc!2m2!1d31.2590152!2d30.0443929!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
		Al-Mū'ayyad Šayẖ Mosque	190	Religious (Mosque)	30.04366255453845, 31.25746740330863	200 m	3 min	15	https://www.google.com/maps/dir/Al-Fakahany+Mosque,+Haret+Al+Akadeya,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293003%E5%9F%83%E5%8F%8A/Al+Motaz+Ldin+Allah,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/@30.0438646,31.2573378,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x145840a1175b2bef:0xf83decb6ece159dc!2m2!1d31.2590152!2d30.0443929!1m5!1m1!1s0x145840a152d3072f:0x6aa68b08b17b41c1!2m2!1d31.2573609!2d30.0433253!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
		Al-Ṣāliḥ Ṭalā'i' Mosque	116	Religious (Mosque)	30.04244126223284, 31.258126396364208	210 m	3 min	15	https://www.google.com/maps/dir/30.04366255453845,+31.25746740330863/30.04244126223284,+31.258126396364208/@30.0430008,31.2571984,363m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2574674!2d30.0436626!1m3!2m2!1d31.2581264!2d30.0424413!3e2?entry=ttu (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
3	*Total Route*					950 m	12 min	60	https://www.google.com/maps/dir/Islamic+Cairo,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+%E5%BC%80%E7%BD%97%E7%9C%81%E5%9F%83%E5%8F%8A/Al+Ghuri+Dome,+27W6+C2H,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293020%E5%9F%83%E5%8F%8A/Al-Fakahany+Mosque,+Haret+Al+Akadeya,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293003%E5%9F%83%E5%8F%8A/Al+Motaz+Ldin+Allah,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/27R5+W6X,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4292233%E5%9F%83%E5%8F%8A/@30.0444407,31.2569757,928m/data=!3m1!1e3!4m32!4m31!1m5!1m1!1s0x145840a1ad78d833:0x85840ff05eee1bf8!2m2!1d31.259588!2d30.0459459!1m5!1m1!1s0x14584173fb938fb3:0x9bdfcf287e66e8f5!2m2!1d31.2601092!2d30.0460609!1m5!1m1!1s0x145840a1175b2bef:0xf83decb6ece159dc!2m2!1d31.2590152!2d30.0443929!1m5!1m1!1s0x145840a152d3072f:0x6aa68b08b17b41c1!2m2!1d31.2573609!2d30.0433253!1m5!1m1!1s0x145840a6b99115c5:0xe13cafbd35c31a2c!2m2!1d31.2580763!2d30.0423248!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
4	*Al-Darb Al-Aḥmar Street*	The Complex of Qiğmās Al-Isḥāqī	114	Religious (Madrasa)	30.04144780153493, 31.260188173985746				Start point https://www.google.com/maps/dir/30-28+Abou+Harbaya,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4293040%E5%9F%83%E5%8F%8A/1-15+Atfet+Saymaa,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4292410%E5%9F%83%E5%8F%8A/@30.0402022,31.2590636,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x145840a7238518e5:0xf1548c1cdc22cd7d!2m2!1d31.2602656!2d30.0414557!1m5!1m1!1s0x145840a7b5dc670f:0x6fd6ca3c3d45dc9c!2m2!1d31.2601959!2d30.0387891!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
		The House of Al-Ašraf Qāytbāy	228	Domestic (House)	30°02′20″ N 31°15′37″ E	450 m	6 min	15	
		The House of Al-Razzāz	235	Domestic (House)	30.03750585888706, 31.25948177928676	190 m	3 min	15	https://www.google.com/maps/dir/1-15+Atfet+Saymaa,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4292410%E5%9F%83%E5%8F%8A/58+Bab+El-Wazir,+El-Darb+El-Ahmar,+Al-Darb+Al-Ahmar,+Cairo+Governorate+4292322%E5%9F%83%E5%8F%8A/@30.0377179,31.2585028,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x145840a7b5dc670f:0x6fd6ca3c3d45dc9c!2m2!1d31.2601959!2d30.0387891!1m5!1m1!1s0x145840a62bcc3a87:0xf3e19cdb43d1c0ea!2m2!1d31.2594677!2d30.0376305!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
4	*Total Route*					640 m	9 min	30	https://www.google.com/maps/dir/30.04144780153493,+31.260188173985746/30%C2%B002'20%22N+31%C2%B015'37%22E/30.03750585888706,+31.25948177928676/@30.0394928,31.2572917,726m/data=!3m2!1e3!4b1!4m14!4m13!1m3!2m2!1d31.2601882!2d30.0414478!1m3!2m2!1d31.2602778!2d30.0388889!1m3!2m2!1d31.2594818!2d30.0375059!3e2?entry=ttu (accessed on 7 January 2025)
5	*Beneath the Citadel of Al-Ǧabal*	The Bīmāristān of Al-Mū'ayyad Šayḫ	257	Domestic (Hospital)	30°01′58″ N 31°15′33″ E				Start point
		The Mosque of Manǧak Al-Silaḥdār	138	Religious (Mosque)	30.033275838144082, 31.261879800796486	650 m	9 min	15	https://www.google.com/maps/dir/Bimarestan+of+Sultan+Al+Moayad+Sheikh%D8%8C+2+%D8%B3%D9%83%D8%A9+%D8%A7%D9%84%D9%83%D9%88%D9%85%D9%8A%D8%8C+%D8%A7%D9%84%D8%AF%D8%B1%D8%A8+%D8%A7%D9%84%D8%A3%D8%AD%D9%85%D8%B1%D8%8C,+Cairo+Governorate%E5%9F%83%E5%8F%8A%E2%80%AD/2+Passage+Under+Mansheia,+El+Khalifa,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/@30.03256,31.2587514,464m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x14584169df0a654f:0x48e3fa21df0c6720!2m2!1d31.2591379!2d30.0328963!1m5!1m1!1s0x145840a9db449603:0x5e1eebc52a308c67!2m2!1d31.2619998!2d30.0333232!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
		The Madrasa of Qānṭbāy Al-Rammāḥ	136	Religious (Madrasa)	30.03231266681237, 31.25792220253964	500 m	7 min	15	https://www.google.com/maps/dir/30.033275838144082,+31.261879800796486/30.03231266681237,+31.25792220253964/@30.0326734,31.2587016,363m/data=!3m2!1e3!4b1!4m10!4m9!1m3!2m2!1d31.2618798!2d30.0332758!1m3!2m2!1d31.2579222!2d30.0323127!3e2?entry=ttu (accessed on 7 January 2025)
	Total Route					1.15 km	16 m	30	https://www.google.com/maps/dir/30%C2%B001'58%22N+31%C2%B015'33%22E/30.033275838144082,+31.261879800796486/30.03231266681237,+31.25792220253964/@30.0321608,31.2587928,363m/data=!3m1!1e3!4m14!4m13!1m3!2m2!1d31.2591667!2d30.0327778!1m3!2m2!1d31.2618798!2d30.0332758!1m3!2m2!1d31.2579222!2d30.0323127!3e2?entry=ttu (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
		The Palace of Ṭāẓ	267	Domestic (Palace)	30°01′55″ N 31°15′11″ E				Start point
		The Madrasa of Ṣarġatmaš	218	Religious (Madrasa)	30°01′46″ N 31°14′57″ E	550 m	8 min	15	https://www.google.com/maps/dir/11+Al+Soufeya,+El-Darb+El-Ahmar,+El+Khalifa,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/24-22+Al+Dahdora,+El+Sayeda+Zeinab,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/@30.0310714,31.2498471,929m/data=!3m1!1e3!4m14!4m13!1m5!1m1!1s0x145840ada37c2607:0xde4b49f2ae16ee71!2m2!1d31.2529301!2d30.0318658!1m5!1m1!1s0x1458474d2faac833:0x45ecfd655a5b1693!2m2!1d31.2489563!2d30.0295683!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
	Al-Ṣalība/ Al-Sayyida Zaynab Streets								
6		The Mosque of Qānībāy Al-Rammāḥ	254	Religious (Mosque)	30.037700034141633, 31.244734120747804	1.3 km	18 min	15	https://www.google.com/maps/dir/30%C2%B001′46%22N+31%C2%B014′57%22E/30.037700034141633,+31.244734120747804/@30.0338146,31.2429493,1452m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2491667!2d30.0294444!1m3!2m2!1d31.2447341!2d30.0377!3e2?entry=ttu (accessed on 7 January 2025)
	Total Route					1.8 km	26	30	https://www.google.com/maps/dir/11+Al+Soufeya,+El-Darb+El-Ahmar,+El+Khalifa,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/24-22+Al+Dahdora,+El+Sayeda+Zeinab,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/61-62+El-Nasereya,+Al+Hanafi,+El+Sayeda+Zeinab,+Cairo+Governorate,+%E5%9F%83%E5%8F%8A/@30.0333576,31.2422428,1857m/data=!3m1!1e3!4m20!4m19!1m5!1m1!1s0x145840ada37c2607:0xde4b49f2ae16ee71!2m2!1d31.2529301!2d30.0318658!1m5!1m1!1s0x1458474d2faac833:0x45ecfd655a5b1693!2m2!1d31.2489563!2d30.0295683!1m5!1m1!1s0x145840b6cf22bdfd:0x5781b2730b23a857!2m2!1d31.2448914!2d30.0377114!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)

Table 1. *Cont.*

No.	Area (Route)	Site Names	Arch. No.	Type	Google Earth Code	Routs	Average Walking Speed/ min	Average Visit Time/ min	Link
		The Madrasa of Al-Ašraf Īnāl	158	Religious (Madrasa)	30.05286920543514, 31.27932909004152				Start point
		The ḫānqāh of Al-Ašraf Barsbāy	121	Religious (ḫānqāh)	30.047538333218114, 31.27709029026585	850 m	12 min	15	https://www.google.com/maps/dir/30.05286920543514,+31.27932909004152/30.047538333218114,+31.27709029026585/@30.0505553,31.2751347,726m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2793291!2d30.0528692!1m3!2m2!1d31.2770903!2d30.0475383!3e2?entry=ttu (accessed on 7 January 2025)
		The Madrasa of Al-Ašraf Qāytbāy	99	Religious (Madrasa)	30.044026598080666, 31.27498576652407	450 m	6 min	15	https://www.google.com/maps/dir/30.047538333218114,+31.27709029026585/30.044026598080666,+31.27498576652407/@30.0458315,31.2738475,475m/data=!3m1!1e3!4m10!4m9!1m3!2m2!1d31.2770903!2d30.0475383!1m3!2m2!1d31.2749858!2d30.0440266!3e2?entry=ttu (accessed on 7 January 2025)
	Al-Qarāfa District								
7		The Maq'ad of Al-Ašraf Qāytbāy	101	Domestic (Loggia)	30.044205842103608, 31.274152952318186	140 m	2 min	15	https://www.google.com/maps/dir/Monsha'et+Nasser,+El-Gamaleya,+Manshiyat+Naser,+%E5%BC%80%E7%BD%97%E7%9C%81+4420303%E5%9F%83%E5%8F%8A/Maqad+of+Sultan+Qaitbey,+El-Soultan+Ahmed,+El-Gamaleya,+Manshiyat+Naser,+Cairo+Governorate+4420303%E5%9F%83%E5%8F%8A/@30.0440482,31.273538,464m/data=!3m2!1e3!4b1!4m14!4m13!1m5!1m1!1s0x14583f681d05b78f:0xaf3983705df5e91a!2m2!1d31.2749307!2d30.0439408!1m5!1m1!1s0x14583f680059092f:0x4ad9b533e0d53b9c!2m2!1d31.2741931!2d30.0441147!3e2?entry=ttu&g_ep=EgoyMDI1MDExMC4wIKXMDSoASAFQAw== (accessed on 7 January 2025)
	Total Route					1.44 km	20 min	45	https://www.google.com/maps/dir/30.05286920543514,+31.27932909004152/30.047538333218114,+31.27709029026585/30.044026598080666,+31.27498576652407/30.044205842103608,+31.274152952318186/@30.0485012,31.2719529,1452m/data=!3m2!1e3!4b1!4m18!4m17!1m3!2m2!1d31.2793291!2d30.0528692!1m3!2m2!1d31.2770903!2d30.0475383!1m3!2m2!1d31.2749858!2d30.0440266!1m3!2m2!1d31.274153!2d30.0442058!3e2?entry=ttu (accessed on 7 January 2025)

Table 2. Basic parameters.

Parameter	Value	Basis
Operating Hours	480 min (8 h)	Standard Cairo monument hours
Site Capacity	50 visitors	Mamluk architectural spaces average
Walking Speed	4 km/h	Historic urban context average
Visit Duration	15 min	Pilot studies
Max Walking Distance	2000 m	Field observations

Table 3. SVC formula components.

Component	Formula
SVC	(Operating Hours × Site Capacity)/Total Route Time
Total Route Time	Walking Time + Visit Duration

The Sustainable Visitation Index (SVI) for Mamluk monuments is calculated using three weighted factors that reflect the essential aspects of heritage site visitation (see Table 4). Time efficiency (TE), weighted at 0.4 (40%), represents the most significant factor as it measures the effectiveness of time allocation between monument visits and walking periods, calculated as (Visit time/Total route time) × 100, emphasizing that the primary purpose of heritage routes is monument engagement rather than transit time. Site distribution (SD), weighted at 0.3 (30%), evaluates the spatial arrangement of monuments along each route, computed as (Number of sites/Average sites across all routes) × 100, reflecting how well the monuments are dispersed within the historic urban fabric to create a coherent visitor experience. The comfort factor (CF), also weighted at 0.3 (30%), assesses the physical accessibility and walking comfort of each route, determined by the formula (1 − (Route length/2000 m)) × 100, where 2000 m represents the maximum comfortable walking distance identified through visitor behavior analysis in Old Cairo's Mamluk monuments-specific urban and climatic context. These three factors, when combined in the formula SVI = (TE × 0.4) + (SD × 0.3) + (CF × 0.3), provide a comprehensive assessment of the route's sustainability and visitor experience quality within the historic Islamic urban setting (Table 5).

Table 4. SVI components and weights.

Component	Weight	Formula	Purpose
Time Efficiency (TE)	0.4	(Visit time/Total route time) × 100	Measures effective time use
Site Distribution (SD)	0.3	(Number of sites/Average sites) × 100	Evaluates spatial arrangement
Comfort Factor (CF)	0.3	(1 − (Route length/2000 m)) × 100	Assesses walking comfort

Table 5. Final calculation example.

Step	Calculation
1	Calculate SVC = (480 × 50)/Total Route Time
2	Calculate TE = (Visit time/Total route time) × 100
3	Calculate SD = (Number of sites/Average sites) × 100
4	Calculate CF = (1 − (Route length/2000 m)) × 100
5	Final SVI = (TE × 0.4) + (SD × 0.3) + (CF × 0.3)

4. Findings and Discussion

The analysis of sustainable tourism capacity in Historic Cairo's primary heritage routes reveals a complex interplay between theoretical management frameworks and practical challenges on the ground. The study examined seven critical routes through the lens

of sustainable visitor capacity (SVC) and Sustainable Visitation Index (SVI), providing crucial insights into the carrying capacity and management potential of these historically significant corridors (see Tables 6–9).

Table 6. Route calculations.

Route Area	Total Route Time	Number of Sites	Route Length	SVC (Visitors/Day) Calculation	SVC (Visitors/Day)	SVI Calculation	SVI (Out of 100)
Northern Al-Mu'izz Street	51 min	4	440 m	SVC = (480 × (50 × 4))/51	1882	SVI = (88.2 × 0.4) + (114.3 × 0.3) + (78 × 0.3)	92.8
Al-Ǧammāliya Street	33 min	3	193 m	SVC = (480 × (50 × 3))/33	2182	SVI = (90.9 × 0.4) + (85.7 × 0.3) + (90.4 × 0.3)	89.3
Southern Al-Mu'izz Street	72 min	5	950 m	SVC = (480 × (50 × 5))/72	1667	SVI = (83.3 × 0.4) + (142.9 × 0.3) + (52.5 × 0.3)	91.6
Al-Darb Al-Aḥmar Street	39 min	3	640 m	SVC = (480 × (50 × 3))/39	1846	SVI = (76.9 × 0.4) + (85.7 × 0.3) + (68 × 0.3)	76.7
Beneath the Citadel of Al-Ǧabal	46 min	3	1150 m	SVC = (480 × (50 × 3))/46	1565	SVI = (65.2 × 0.4) + (85.7 × 0.3) + (42.5 × 0.3)	63.8
Al-Ṣalība/Al-Sayyida Zaynab Streets	56 min	3	1800 m	SVC = (480 × (50 × 3))/56	1286	SVI = (53.6 × 0.4) + (85.7 × 0.3) + (10 × 0.3)	48.9
Al-Qarāfa District	65 min	4	1440 m	SVC = (480 × (50 × 4))/65	1477	SVI = (69.2 × 0.4) + (114.3 × 0.3) + (28 × 0.3)	69.8

Table 7. Summary table.

Route Area	SVC (Visitors/Day)	SVI (Out of 100)
Northern Al-Mu'izz Street	1882	92.8
Al-Ǧammāliya Street	2182	89.3
Southern Al-Mu'izz Street	1667	91.6
Al-Darb Al-Aḥmar Street	1846	76.7
Beneath the Citadel of Al-Ǧabal	1565	63.8
Al-Ṣalība/Al-Sayyida Zaynab Streets	1286	48.9
Al-Qarāfa District	1477	69.8

Table 8. Comparative performance summary of heritage routes in Mamluk Cairo.

Route Name	Key Characteristics	Performance Factors	Challenges
Al-Ǧammāliya Street	- 3 sites—193 m length—33 min duration	- Most efficient route—Compact configuration—Optimal site spacing	- Market integration—Workshop activities—Exceeds capacity during peak seasons
Northern Al-Muʿizz Street	- 4 sites—440 m length—51 min duration	- Highest SVI—Well-balanced distribution—Efficient spatial organization	- Commercial activities—High tourist popularity—Local–tourist conflicts
Al-Darb Al-Aḥmar Street	- 3 sites—640 m length—39 min duration	- Moderate efficiency—Good site spacing—Balanced route length	- Residential integration—Market day congestion—Local events impact
Southern Al-Muʿizz Street	- 5 sites—950 m length—72 min duration	- High SVI despite length—Good visitor dispersal—Maximum site coverage	- Commercial corridor pressure—Tour group congestion—Bottlenecks at key points
Beneath the Citadel of Al-Ǧabal	- 3 sites—1150 m length—46 min duration	- Lower efficiency—Proximity to Citadel—Strategic location	- Parking area congestion—Multiple destination traffic—Length management issues
Al-Qarāfa District	- 4 sites—1440 m length—65 min duration	- Moderate SVI—Unique cemetery setting—Religious significance	- Dual-use conflicts—Religious event impacts—Peak-season overflow
Al-Ṣalība/Al-Sayyida Zaynab Streets	- 3 sites—1800 m length—56 min duration	- Lowest performance—Religious significance—Longest route	- Unorganized markets—Religious visitor congestion—Length management issues

4.1. Northern Al-Mu'izz Street

This historically significant route demonstrates sustainability metrics with the highest SVI (92.8) and a suggested strong SVC (1882 visitors/day), suggesting an ideally balanced tourism management framework. The route's efficiency is evident in its spatial organization of four sites over 440 m completed in 51 min, indicating well-planned visitor flow patterns. However, within the site observation, the reality on the ground presents an unambiguous contrast to these theoretical calculations. The street's popularity among tourists and locals, particularly for its vibrant commercial activities and historical significance, means actual visitor numbers frequently exceed the calculated sustainable visitor capacity. Local business activities, resident movement, and unofficial tour groups often create congestion that surpasses the recommended 1882 visitors per day. This overcrowding not only impacts the visitor experience but also poses risks to the area's historic fabric. The challenge lies in implementing effective crowd management strategies that accommodate tourist interests and local needs while maintaining the street's authentic character (see Figure 1).

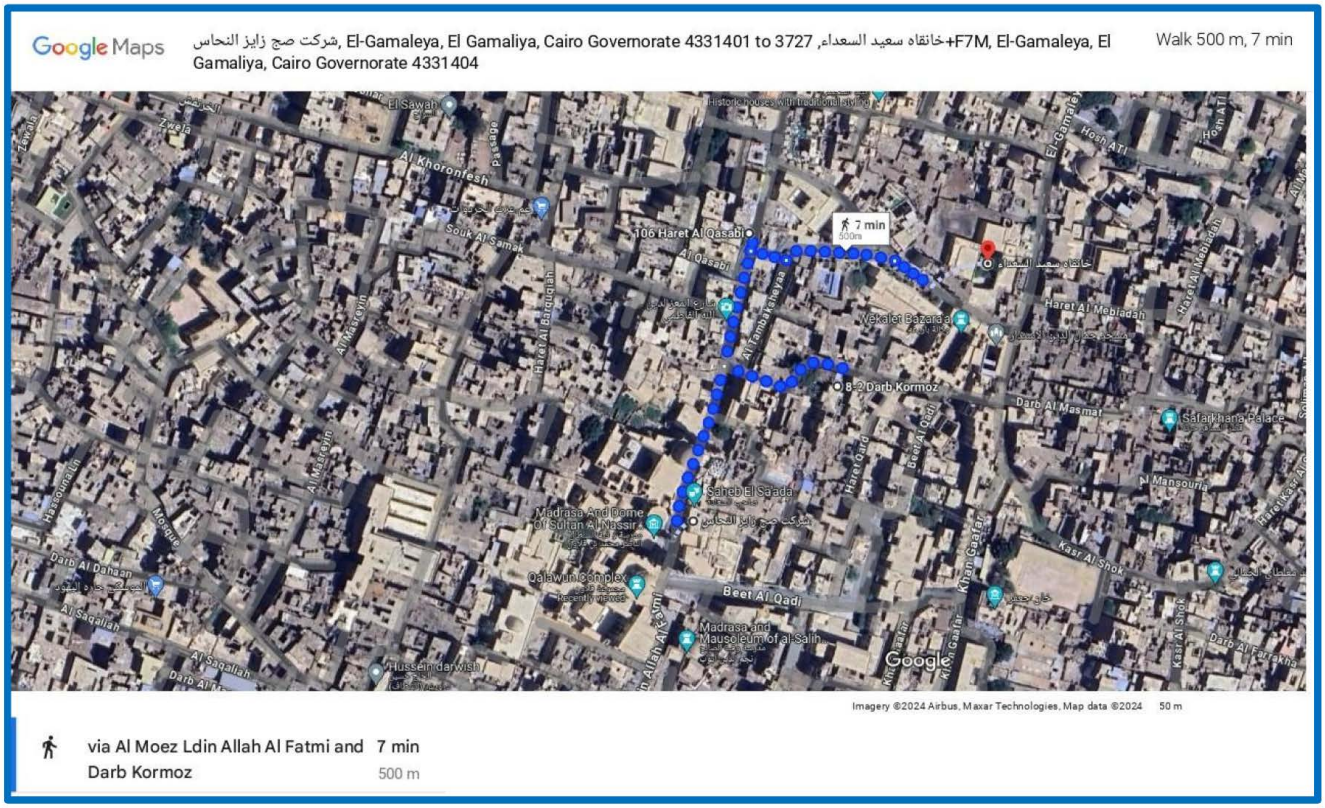


Figure 1. "Map of the 1st hanging route on the northern part of Al-Mu'izz Street in Cairo", 2024. In Google Maps.

4.2. Al-Ğammāliya Street

The exceptional performance of Al-Ğammāliya Street, with the highest recommended SVC (2182 visitors/day) and impressive SVI (89.3), theoretically represents the gold standard in sustainable heritage tourism management. Its compact configuration of three sites over 193 m, completed in just 33 min, demonstrates remarkable efficiency in spatial planning and visitor flow. However, reality presents a more complex picture. The street's integration with local markets, workshops, and residential areas means the daily user count significantly exceeds the calculated sustainable visitor capacity. The presence of traditional crafts workshops, local commerce, and residential activities creates a dynamic but often overcrowded environment. While this vibrancy contributes to the area's authenticity, it

also challenges implementing sustainable tourism practices. The theoretical capacity of 2182 visitors per day is regularly exceeded, particularly during peak seasons and local festivities (see Figure 2).

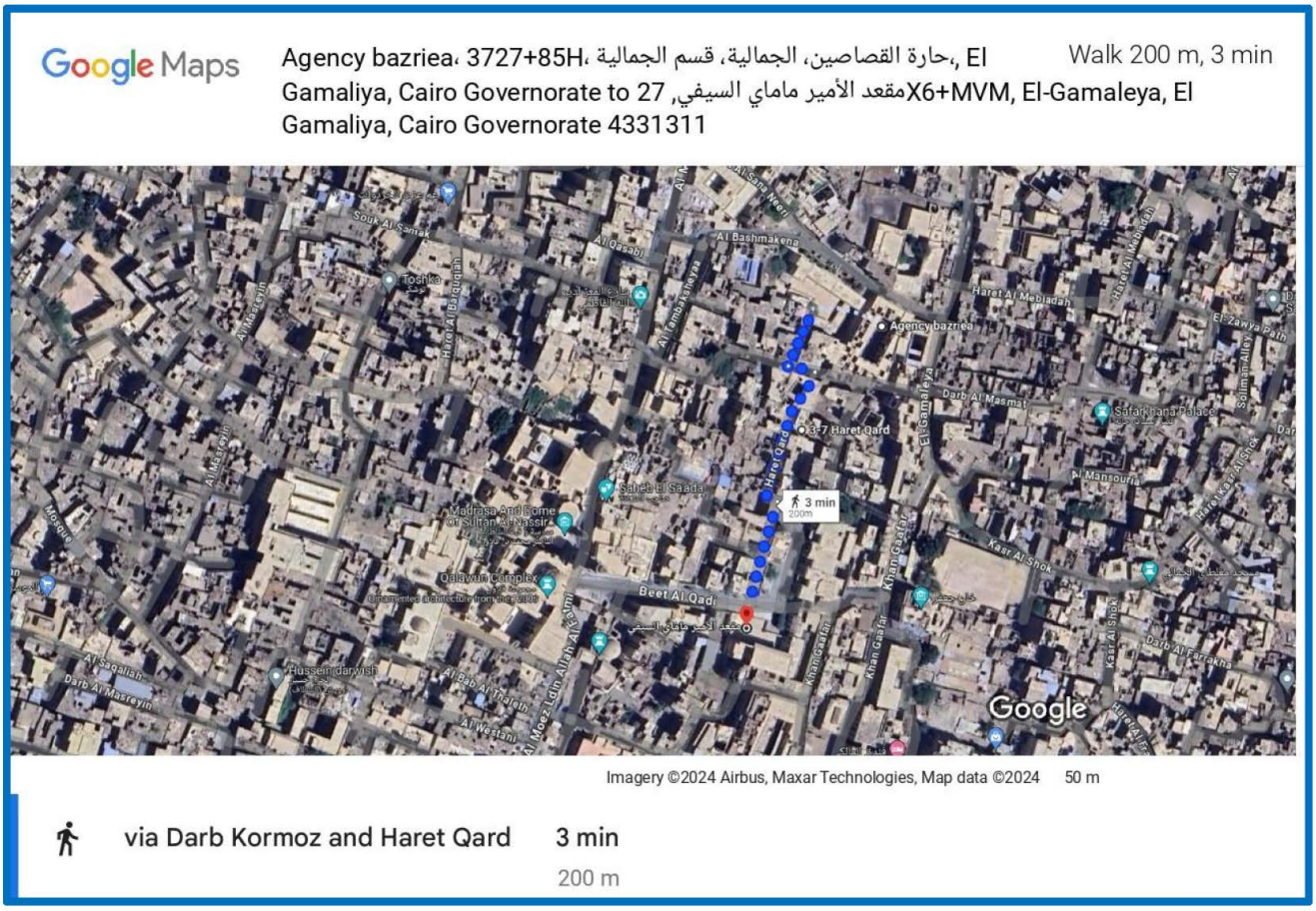


Figure 2. "Map of the 2nd hanging route on the Ğammāliya Street in Cairo", 2024. In Google Maps.

4.3. Southern Al-Mu'izz Street

This extensive route, featuring five sites over 950 m with a 72 min duration, maintains a remarkably high SVI (91.6) despite a lower expected SVC (1667 visitors/day). Theoretically, the route's length and site distribution allow for better visitor dispersal, but actual usage patterns tell a different story. The street's role as a significant commercial and cultural corridor means it experiences intense pressure from tourists and local activities. The calculated sustainable visitor of 1667 visitors daily is frequently overwhelmed by organized tour groups, independent tourists, local shoppers, and residents. The street's dual function as a tourist attraction and vital local thoroughfare creates particular challenges in managing visitor flow. The high concentration of commercial activities, especially in certain sections, leads to congestion bottlenecks exceeding the recommended capacity, potentially compromising visitor experience and site preservation (see Figure 3).

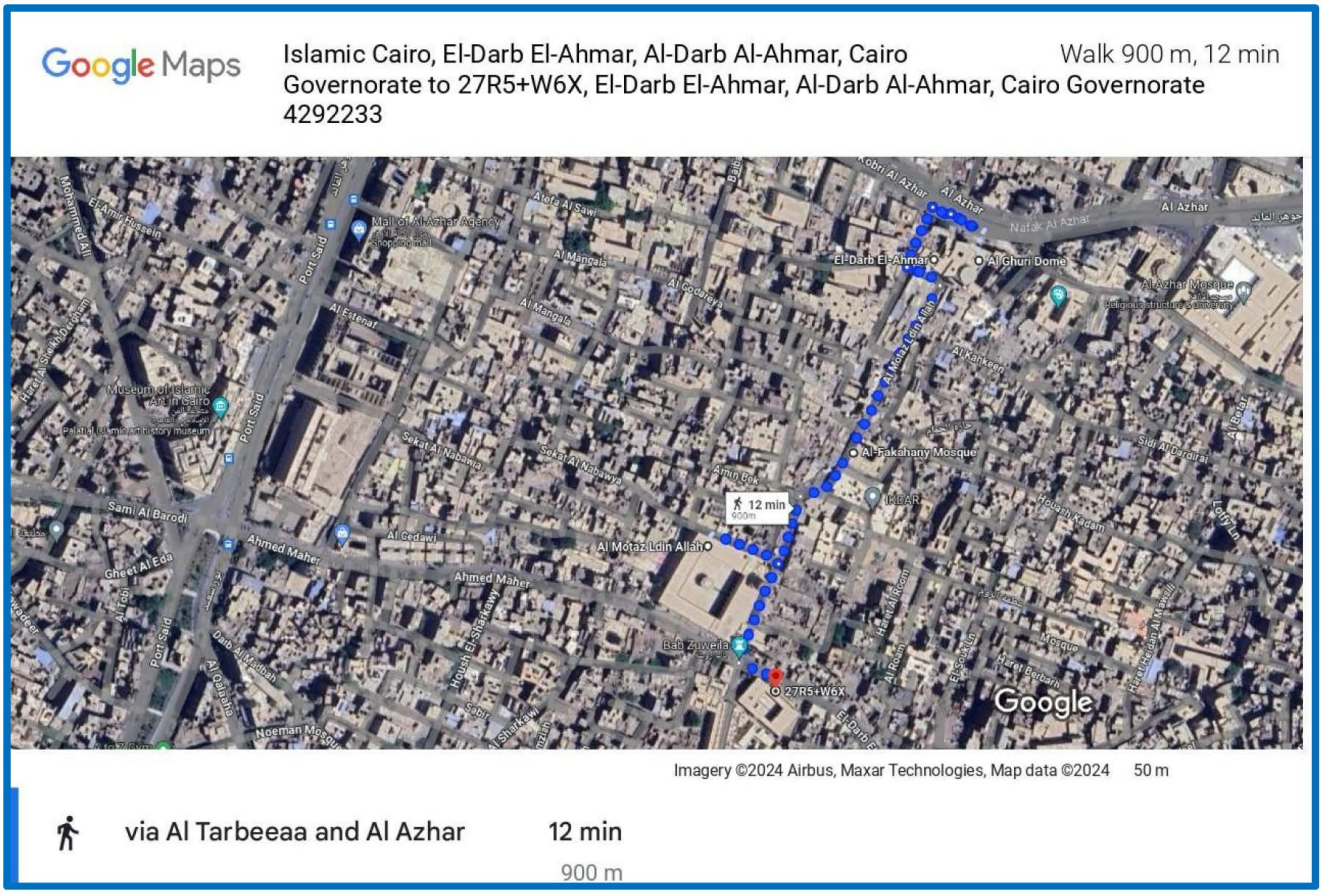


Figure 3. "Map of the 3rd hanging route on the southern part of Al-Mu'izz Street in Cairo", 2024. In Google Maps.

4.4. Al-Darb Al-Aḥmar Street

With moderate sustainability indicators (SVC: 1846 visitors/day, SVI: 76.7), this route presents an exciting case of balanced theoretical performance that faces practical implementation challenges. The route's configuration of three sites over 640 m in 39 min suggests efficient planning, but local realities complicate this picture. The street's deep integration with residential areas and local commercial activities means the daily user count significantly exceeds the calculated sustainable visitor capacity. The theoretical capacity is regularly exceeded, particularly during market days and local events, highlighting the need for more effective management strategies that consider both tourism and local community needs (see Figure 4).

4.5. Beneath the Citadel of Al-Ǧabal

The route's lower sustainability metrics (SVC: 1565 visitors/day, SVI: 63.8) reflect the challenges of managing a longer route (1150 m) with three sites. However, the actual situation is more complex than these numbers suggest. Despite the calculated capacity of 1565 visitors daily, the area often experiences much higher visitor numbers, mainly due to its proximity to the Citadel, a major tourist attraction. There is a problem in the car park area around this site, serving more than 30 local destinations with hundreds of passengers, resulting in congestion that exceeds the sustainable visitor capacity. The route's length and spatial distribution are challenging from a management perspective (see Figure 5).

Figure 4. "Map of the 4th hanging route on Al-Darb Al-Aḥmar Street in Cairo", 2024. In Google Maps.

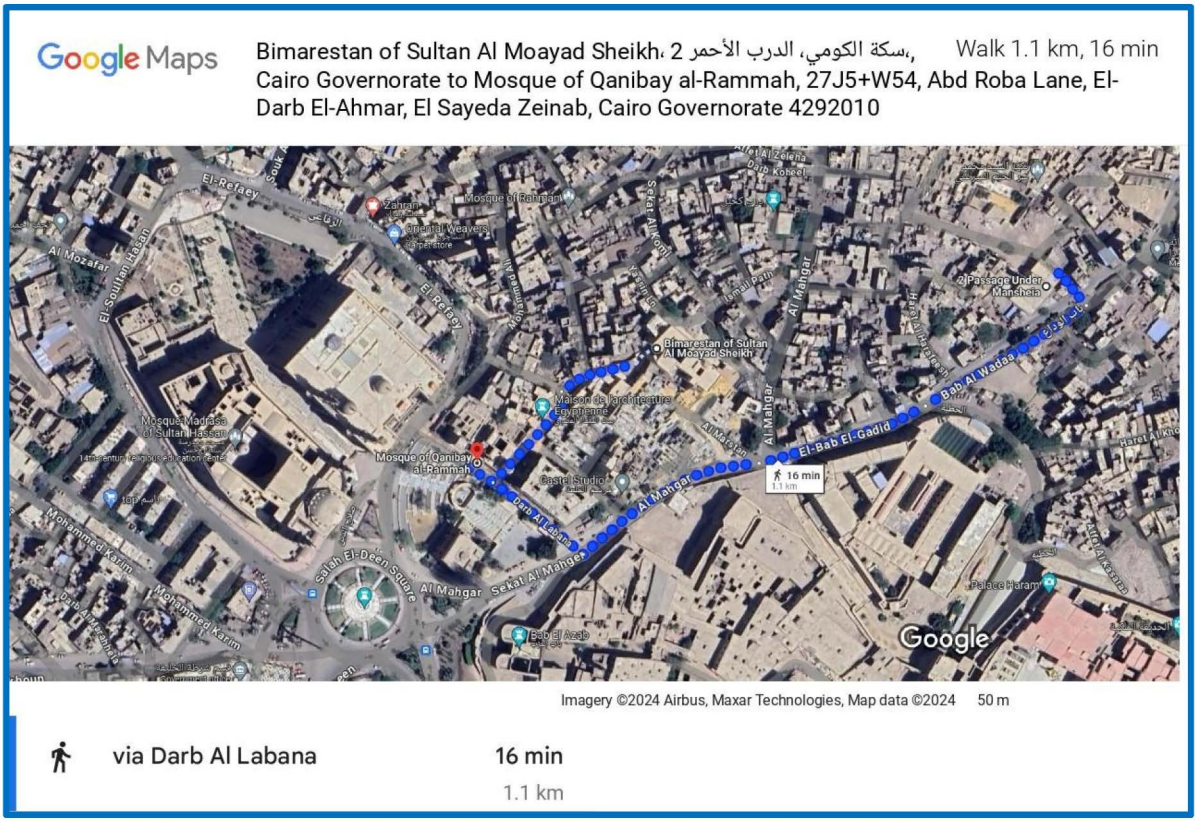


Figure 5. "Map of the 5th hanging route beneath the Citadel of Al-Ǧabal in Cairo", 2024. In Google Maps.

4.6. Al-Ṣalība/Al-Sayyida Zaynab Streets

This route's lowest sustainability indicators (SVC: 1286 visitors/day, SVI: 48.9), the low SVI shows that this route suffers from many locals related congestion, especially the comfort factor, with many unorganized markets in this area, reflecting the significant challenges of managing the longest route (1800 m) effectively. The theoretical capacity calculations suggest limited sustainable visitor numbers, yet the reality shows much higher usage patterns, mainly due to the area's religious and cultural significance. Critical religious sites attract large numbers of local worshippers and visitors, regularly exceeding the calculated sustainable visitor capacity. This creates a complex management challenge where religious, cultural, and tourism activities must be balanced within a historically sensitive environment (see Figure 6).

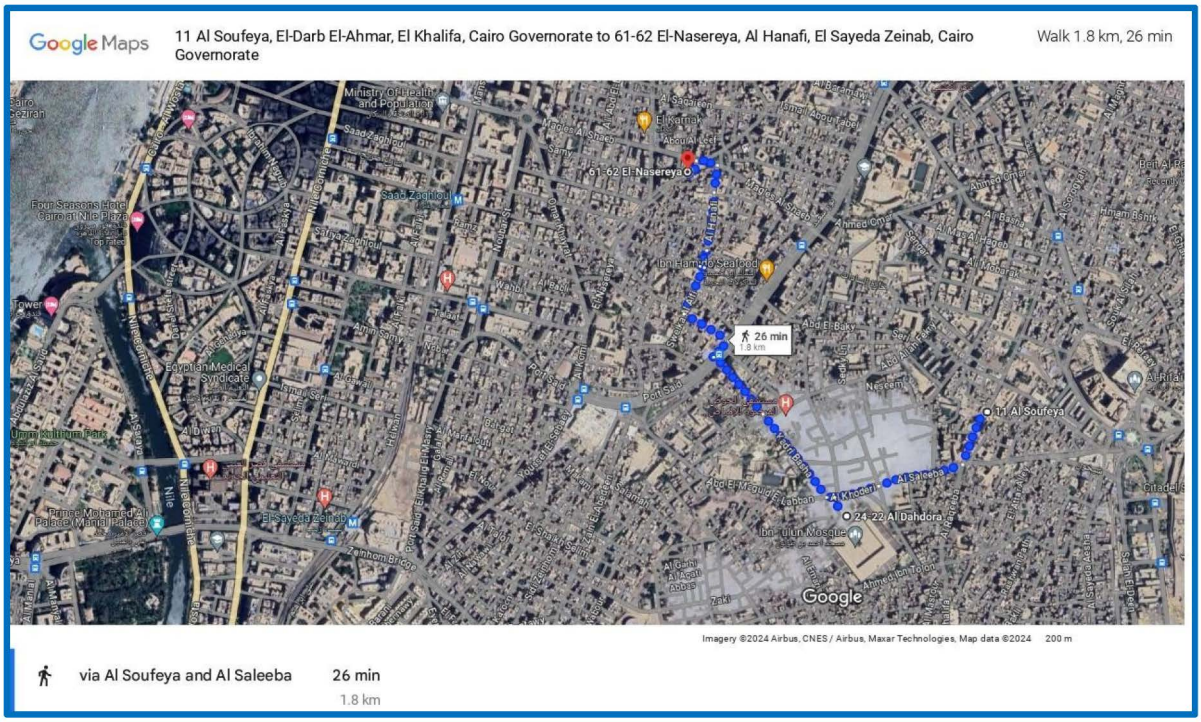


Figure 6. "Map of the 6th hanging route on Al-Ṣalība/Al-Sayyida Zaynab Streets in Cairo", 2024. In Google Maps.

4.7. Al-Qarāfa District

This route's moderate sustainability metrics (SVC: 1477 visitors/day, SVI: 69.8) reflect its unique challenges as a historical cemetery district turned tourist attraction. The route's four sites spread over 1440 m with a 65 min duration suggest potential for managed tourism, but actual usage patterns are more complex. The district's dual function as an active cemetery and heritage site creates unique management challenges. While the calculated capacity suggests moderate visitor numbers, the combination of touristic interest, religious visitors, and local activities often results in usage patterns that exceed sustainable levels. This is particularly evident during religious occasions and peak tourist seasons when visitor numbers can significantly surpass the recommended 1477 daily visitors (see Figure 7).

Figure 7. "Map of the 7th hanging route at the Qarāfa district in Cairo", 2024. In Google Maps.

Table 9. Visual collection of study plates (Pl.).

Pl. I: "The mosques of Al-Ṣāliḥ Ṭalā'i'in front of Zūwiyla gate", 2024.

Pl. II: "The main façade of the Aqmar Mosque at Al-Muʿizz Street", 2024.

Pl. III: "The main façade of the Afẖar mosque", 2024.

Pl. IV: "The mosque of Amīr Manğak Al-Silḥdār above Al-ṯaġra at Al-Ḥaṭṭāba district", 2024.

Table 9. *Cont.*

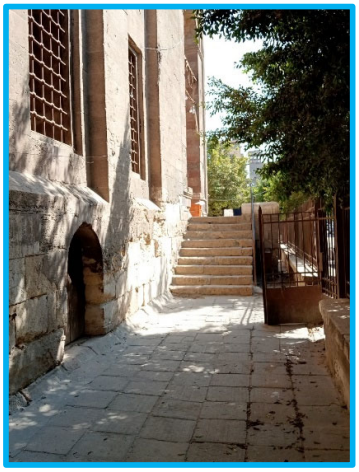
Pl. V: "The Madrasa of Amīr Ṣarġatmaš overlooking Al-ḫuḍīry Street", 2024.

Pl. VI: "The madrasa of Amīr Miṭqāl Al-Anūkī at Darb Qurmuz", 2024.

Pl. VII: "The madrasa of Amīr Ǧamāl al-Dīn Al-Ustādār", 2024.

Pl. VIII: "The Mosque of Sultan Al-Mū'ayyad Šayḫ next to Bāb Zūwayla", 2024.

Pl. IX: "The Madrasa of Sultan Al-Ašraf Barsbāy at Al-Mu'izz Street", 2024.



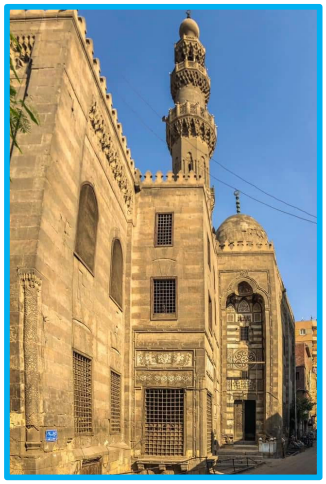
Pl. X: "The ḫānqāh of Sultan Al-Ašraf Barsbāy at the Mamlūk Cemetery", 2024.

Table 9. *Cont.*

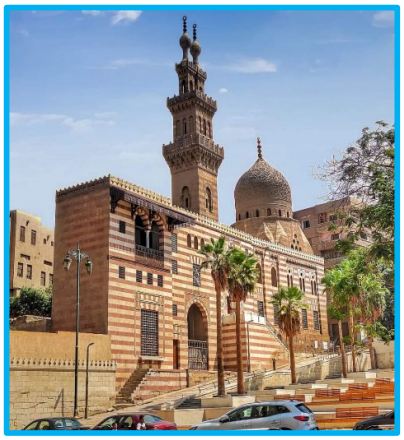
Pl. XI: "The Madrasa of Sultan Al-Ašraf Īnāl at the Mamlūk cemetery", 2024.

Pl. XII: "The Madrasa of Sultan Al-Ašraf Qāytbāy at the Mamlūk cemetery", 2024.

Pl. XIII: "The Madrasa of Al-Qāḍī Abū-Bakr Ibn Muzhar at Ḥārat Burǧwān", 2024.



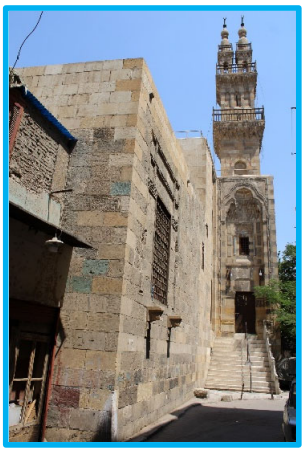
Pl. XIV: "The Madrasa of Amīr Qiğmās Al-Isḥāqī at Al-Darb Al-Aḥmar Street", 2024.



Pl. XV: Aḥmad ʿIssā, "The Madrasa of Amīr Qānībāy Al-Ṙammāḥ at Al-Rumīla Square", 2024.

Pl. XVI: "The Madrasa of Sultan Qānṣūh Al-Ġawrī at the intersection of Al-Muʿizz Street and Azhar Street", 2024.

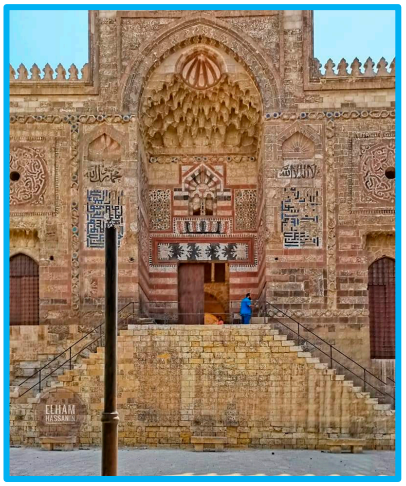
Table 9. *Cont.*



Pl. XVII: "The Mosque of Amīr Qānībāy Al-Rammāḥ located on Al-Nāṣiriya Street", 2024.

Pl. XVIII: "The palace of Amīr Baštāk overlooking Al-Mu'izz and Darb Qurmuz Streets", 2024.

Pl. XIX: "The main façade of the palace of Amīr Ṭāẓ at Al-Siwūfiya Street", 2024.

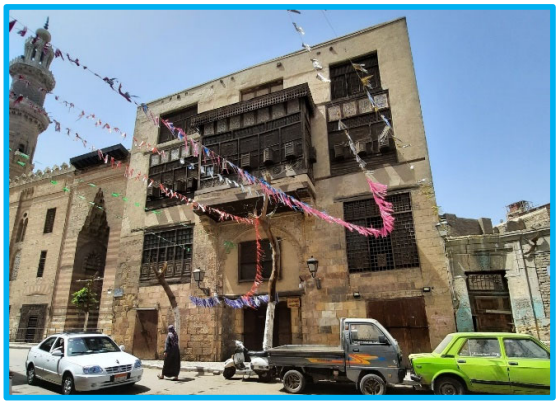


Pl. XX: "The striking Bīmāristān of Sultan Al-Mū'ayyad Šayḫ at Sikat Al-Maḫǧar Street", 2024.

Pl. XXI: "The Maqʿad of Sultan Al-Ašraf Qāytbāy at the Mamlūk cemetery", 2024.

Pl. XXII: "The house of Sultan Al-Ašraf Qāytbāy at Sikat Al-Mardānī Street", 2022.

Table 9. *Cont.*



Pl. XXIII: "The house of Sultan Al-Ašraf Qāytbāy's, known as Al-Razzāz, in Al-Tabbāna Street", 2024.

Pl. XXV: "The Maqʿad of Sultan Qānṣūh Al-Ġawrī, with aground floor includes three stores and a corridor", 2024.

Pl. XXIV: "The Maqʿad of Amīr Māmāy Al-Sayfī at Bayt Al-Qāḍī Square", 2024.

5. Conclusions

The sustainable visitor land capacity modeling and analysis conducted for the Mamluk land offer significant contributions to the existing literature on heritage management and sustainable tourism. The study's findings provide crucial insights that can inform both academic discourse and practical decision-making processes.

Theoretically, this research adds depth to the ongoing discussions around carrying capacity assessments in cultural heritage sites.

5.1. Theoretical Contribution

By developing a comprehensive framework that incorporates the sustainable visitor capacity (SVC) and the Sustainable Visitation Index (SVI), the study presents a multifaceted approach to evaluating the sustainability of visitor dynamics. The SVC metric goes beyond simplistic visitor volume calculations by considering operating hours, site capacity, and the time required for both walking and monument visits. This nuanced analysis allows for a more accurate estimation of the maximum sustainable visitor numbers that can be accommodated without compromising the integrity of the historic sites. Similarly, the SVI offers a holistic evaluation of the visitor experience, considering the efficiency of time

allocation, the spatial distribution of monuments, and the physical comfort of the routes. By weighing these three key factors (time efficiency, site distribution, and comfort factor), the SVI provides a composite score that reflects the overall sustainability of the visitor experience. This approach aligns with the growing recognition in the heritage management literature that sustainable tourism should prioritize the quality of visitor engagement and preserve cultural and environmental resources [1,3].

The study's findings also contribute to the ongoing discourse on balancing tourism development and local community needs in historic urban centers [2,9]. The contrasts between the theoretical sustainable visitor capacity calculations and the actual visitor dynamics observed on the ground highlight the complex realities that heritage managers and policymakers must navigate. The researchers' identification of the integration of tourist activities with local commercial, residential, and religious uses as a critical factor contributing to overcrowding underscores the importance of adopting holistic, community-centric approaches to sustainable tourism planning [10,17].

5.2. Managerial Implications

From a managerial perspective, the insights derived from this study can significantly benefit various stakeholders and authorities responsible for the stewardship of the Mamluk monuments in Cairo. For heritage site managers, for the Northern Al-Mu'izz Street route, site managers should consider implementing a dynamic visitor management system that can adapt to fluctuating demand. This may include timed-entry ticketing, strategic signage and wayfinding to distribute visitors along the route, and coordinating guided tour schedules to avoid bottlenecks. Additionally, engaging with local stakeholders, such as business owners and community leaders, to develop collaborative crowd control strategies can help balance the needs of tourists and the local population [11,27].

The Al-Ǧammāliya Street route, with its exceptionally high SVC of 2182 visitors per day and an impressive SVI of 89.3, represents a theoretical model of sustainable heritage tourism management. Yet, integrating local markets, workshops, and residential areas creates a dynamic but often overcrowded environment that regularly exceeds the calculated capacity. In this case, site managers should consider implementing a zoning system that allocates dedicated spaces for different user groups, such as tourists, local businesses, and residents. This can involve the temporary pedestrianization of certain sections during peak periods, the creation of designated tour routes, and the relocation of certain commercial activities to alleviate congestion [4,5].

The Southern Al-Mu'izz Street route, with a high SVI of 91.6 but a lower SVC of 1667 visitors per day, faces the challenge of managing its dual function as a significant commercial and cultural corridor. To address this, site managers should consider implementing a dynamic pricing system for guided tours and designated visitor access points, incentivizing visitors to explore the area during off-peak hours. Additionally, developing a comprehensive wayfinding system and strategically placing rest areas and amenities can help manage visitor flow and enhance the overall experience [6,8].

For the Al-Darb Al-Aḥmar Street route, with a moderate SVC of 1846 visitors per day and an SVI of 76.7, traditional workshops, local markets, and community facilities create a delicate balance between tourism and local community needs. To address this, site managers should explore implementing a visitor reservation system that allocates specific time slots for heritage site visits, allowing for integrating local activities and mitigating overcrowding [6,7].

Additionally, the route beneath the Citadel of Al-Ǧabal, with a lower SVC of 1565 visitors per day and an SVI of 63.8, faces the challenge of managing high visitor numbers due to its proximity to the Citadel, a major tourist attraction. To address this, site managers should

consider establishing a coordinated visitor flow management system with the Citadel, including shuttle services and ticketing integration to distribute visitors across the various heritage sites. Additionally, the route's length and spatial distribution offer opportunities for better visitor dispersal, which can be enhanced through the strategic placement of interpretive nodes and the optimization of walking paths [13]. For the Al-Ṣalība/Al-Sayyida Zaynab Streets route, with the lowest sustainability indicators (SVC: 1286 visitors/day, SVI: 48.9), the significant presence of critical religious sites creates a unique management challenge. Site managers should engage with local religious authorities and community leaders to develop a collaborative framework that balances the needs of religious visitors, tourists, and the historic environment. This may involve the implementation of crowd control measures during peak religious celebrations [14,36].

Finally, the Al-Qarāfa District route reflects the complexity of managing a historic cemetery district that has become a tourist attraction. To address this, site managers should work closely with local authorities and the community to establish a set of protocols, such as the designation of specific visiting hours, the development of interpretive programs that highlight the district's historical and spiritual significance, and the implementation of visitor flow management strategies to mitigate the negative impacts of overcrowding [2,18].

5.3. Policy Implications and Implementation Guidelines

To sum up, the developed SVC and SVI indicators inform targeted policy interventions specific to each route's unique characteristics and challenges. For Al-Ǧammāliya Street, with its compact 193 m length and high efficiency, policies should focus on market-activity scheduling frameworks, implementing time-zoned restrictions for workshop operations, and establishing peak-season visitor quotas to prevent capacity overload. The Northern Al-Muʿizz Street route requires policies addressing commercial-tourism coexistence through dedicated time slots for different activities and implementing a commercial licensing system that regulates business operations during peak tourist hours. For Al-Darb Al-Aḥmar Street, policies should center on residential protection measures, including restricted tourism hours in residential zones and market day scheduling alternating between tourist and local access periods. The Southern Al-Muʿizz Street's 950 m length and high SVI necessitate policies focused on tour group size limitations, timed entry systems at key bottlenecks, and commercial activity zoning that prevents congestion at critical heritage points. The route beneath the Citadel of Al-Ǧabal requires parking management policies, multi-destination visitor flow regulations, and transit connectivity improvements to address its length-related challenges. For the Al-Qarāfa District, policies should focus on religious-tourism compatibility frameworks, including designated prayer times protection, cemetery visit protocols, and seasonal capacity adjustments during religious events. Finally, Al-Ṣalība/Al-Sayyida Zaynab Streets, the longest route at 1800 m, needs policies addressing market organization, religious visitor management systems, and route segmentation strategies to improve its lowest performance indicators. These metrics enable evidence-based resource allocation, with budgeting priorities aligned to each route's specific needs—from infrastructure enhancement in longer routes to comfort amenity addition in high-traffic areas and from staffing deployment optimization based on route duration to dynamic pricing strategies reflecting route-specific carrying capacities.

5.4. The Study Limitations

The comprehensive sustainable visitor capacity modeling and analysis conducted for the Mamluk monuments in Old Cairo provides invaluable insights, but it is important to acknowledge the study's limitations. One fundamental limitation is the reliance on data collected during a specific period, which may not fully capture the seasonal and annual

variations in visitor patterns. The study's findings are based on observations and surveys conducted over a limited duration, and future research should aim to incorporate longitudinal data to better understand the dynamic nature of visitor flows and their impacts on heritage sites. Furthermore, the study relies on expert opinions and predetermined parameters for site capacity and visitor behavior. We suggest future studies incorporate real-time visitor data and dynamic factors such as weather conditions and special events, which could provide a more nuanced understanding of visitor flow and its impact on site sustainability. Additionally, while the study's methodological approach offers a robust framework for evaluating the sustainability of the visitor experience, the quantitative nature of the sustainable visitor capacity (SVC) and Sustainable Visitation Index (SVI) metrics may not fully capture the qualitative aspects of the visitor experience, such as perceptions of authenticity, personal connections, and emotional responses. Incorporating more in-depth qualitative research methods, such as ethnographic observations and visitor interviews, could further enrich the understanding of the multifaceted visitor experience within the historic Mamluk monuments district. Despite these limitations, the study's findings provide a strong foundation for evidence-based decision-making and the development of sustainable heritage management strategies in the Mamluk monuments and potentially serve as a model for similar assessments in other historic urban centers worldwide.

Author Contributions: Conceptualization, A.E.S. and T.H.H.; methodology, T.H.H. and A.T.E.; software, M.I.S. and A.E.S.; validation, T.H.H. and A.T.E.; formal analysis, M.I.S. and A.E.S.; investigation, M.I.S. and T.H.H.; resources, A.E.S. and A.T.E.; data curation, A.T.E. and T.H.H.; writing—original draft preparation, A.E.S. and A.T.E.; writing—review and editing, T.H.H. and M.I.S.; visualization and photoshoots, A.T.E.; supervision, A.T.E. and M.I.S.; project administration, A.E.S. and M.I.S.; funding acquisition, M.I.S. and T.H.H. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Grant No. KFU250080].

Institutional Review Board Statement: This study was conducted according to the guidelines of the Declaration of Helsinki and was approved by the Deanship of Scientific Research Ethical Committee, King Faisal University.

Data Availability Statement: Data are available on request due to privacy/ethical restrictions.

Acknowledgments: We gratefully acknowledge the financial support provided by Grant No. KFU250080 from the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia.

Conflicts of Interest: The authors declare no conflicts of interest.

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