



Reuse Strategies of Urban Areas and Built Heritage: Case Study of Karbala Old City

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Abstract

Preserving urban heritage and identity is a pressing issue in cities undergoing rapid development. The city center of Karbala, home to one of the holiest shrines for Shia Muslims, faces significant pressure from its annual influx of over 20 million pilgrims. This necessitates development initiatives focused on creating vast open areas around the shrines, which involve demolishing approximately half of the old city. This research critically assesses potential problems stemming from this approach and explores alternative solutions. Through analyzing the traditional urban fabric, including its distinctive characteristics, existing open spaces, land use, and pilgrimage movement patterns, and drawing insights from similar practices, it uncovers possibilities within the current city center and strategies to address the demands of increasing visitor numbers without compromising the invaluable historic urban fabric. The research advocates for the pivotal role of "Reuse" in preserving the historic urban fabric, complemented by its rehabilitation and restoration. By utilizing the existing urban fabric, the city can reduce the necessity for extensive demolition and redevelopment, thus safeguarding its distinctive urban character and identity. Additionally, it underscores the essentiality of prioritizing adaptability and flexibility, particularly in light of the significant transformations experienced during the annual event.

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Keywords

Urban Heritage Preservation; Adaptive Reuse; Cultural Heritage; Built Heritage Conservation; Tourism Impact; Historic City Center

1. Introduction

A historical city center serves as a distinctive historical connection to the past, a tangible representation of the societal, cultural traditions, and architectural legacy that have evolved to shape the contemporary city and society. These historical cores, along with their old housing stock, represent urban heritage. It is crucial to maintain the original urban layout and other unique urban elements that contribute to the distinctiveness and essence of historic city centers. Urban heritage encompasses not only physical elements but also intangible aspects like customs and beliefs, which play a role in the articulation of space use and the built environment. Recognizing urban heritage as a valuable asset can lead to its preservation for cultural, economic, and developmental benefits (Steinberg, 1996). With that being

said, development projects must carefully consider any changes to the historic fabric of the city center, aiming to enhance rather than diminish the area's rich heritage.

This becomes especially important in cities experiencing heavy tourism and pilgrimage, where urban development is often shaped by large influxes of visitors. García-Hernández et al. (2017) highlight that tourism can significantly alter the physical, functional, and social fabric of historic areas. These impacts can manifest as environmental degradation, overcrowding, displacement of local populations, and alterations to traditional ways of life.

Research on pilgrimage cities like Mecca and Mashhad illustrates that a surge in pilgrims and significant changes in land-use patterns are primary drivers of urban development. In these cities, the commercialization of pilgrimage sites has turned historically significant areas into speculative markets, leading to the replacement of traditional urban landscapes with high-rise developments and global retail chains. Without proper protective policies, such changes risk eroding the very cultural heritage that defines these places. Historic urban landscapes—once defined by prominent shrines and local crafts—are now being replaced by high-rise mega projects and global retail chains. Additionally, the large investments required for expanding infrastructure and enlarging shrine complexes have fostered stronger public-private partnerships, ultimately leading to the systematic demolition of existing urban structures, the reorganization of land parcels, and the development of large-scale projects (Maroufi & Rosina, 2017).

Conversely, tourism can also support the preservation of cultural heritage by providing the necessary resources for conservation and by increasing public awareness of local cultural values. Therefore, analyzing the effects of tourist influx on historic city centers is essential for designing sustainable conservation initiatives (García-Hernández et al., 2017).

In response to these challenges, modern architectural practice has shifted toward the preservation and adaptive reuse of existing structures over demolition. This approach saves resources and maintains the continuity and character of historic urban landscapes. For example, many old buildings in historic centers have been successfully transformed into shops or offices, blending the old with the new (Shree et al., 2024).

Adaptive reuse, in particular, presents an innovative strategy that bridges the gap between existing infrastructure and contemporary needs. It involves finding a new use for an existing structure that differs from its original purpose. Reusing or repurposing the existing building stock is considered highly sustainable. It provides continuity for the urban landscape to maintain its sense of place, character, and identity while creating opportunities to transform it through renovation, restoration, and redesign of disused, underused, or abandoned buildings (Morel & Dorpalen, 2023).

Importantly, rehabilitation advocates argue for a broader perspective that extends beyond preserving individual landmark buildings and includes the conservation and strategic upgrading of entire urban areas. As Steinberg (1996) emphasizes, attention should be focused not only on architectural value but also on the everyday activities and functional uses of all buildings within historic districts.

Building on these principles, this study investigates strategies that reconcile the needs of modern urban development with the imperative to preserve historical integrity. Central to our approach is the concept of reuse—repurposing existing structures and urban spaces to meet new demands without compromising their inherent character. By examining the current condition of the city center and its underutilized resources, this research aims to explore methods to accommodate the influx of visitors and enhance their experience while preserving the city's historical urban fabric. In doing so, it aims to present viable alternatives to widespread demolition and new development.

2. Materials and Methods

2.1. Description of the Study Area

The city of Karbala, located in Iraq, holds rich cultural, religious, and historical significance, primarily due to its status as a major pilgrimage destination for Shia Muslims. Millions of pilgrims visit Karbala each year to pay their respects and participate in the rituals. The pilgrimage event, known as Arbaeen, is integral to Karbala's identity, influencing its social, cultural, and economic landscape. It serves as a platform for cultural exchange, bringing

together people from different parts of the world, thereby enhancing Karbala's cultural richness. Economically, the event creates significant opportunities for local businesses and individuals, substantially boosting the city's economy.

However, this pilgrimage activity places immense pressure on the old city center with the shrines in its heart, as there is difficulty in absorbing the massive movement of pilgrims during religious events, in which, in the biggest event, more than 20 million pilgrims visit the Holy Shrine. The increasing number of pilgrims poses significant challenges to the city center, specifically in terms of infrastructure, accommodation, transportation, overcrowding, and the degradation of traditional urban areas. Therefore, there is an urgent need for expansion and development projects aimed at accommodating the increasing number of visitors.

As such, the Ministry of Municipalities and Public Works, in conjunction with the General Directorate of Urban Planning, has approved an expansion project for the shrines that will forever transform the city center. This proposal entails creating vast public open spaces around the existing shrines, covering approximately 54% of the current old city (Diwan Architectural Office & Ministry of Municipalities and Public Works [DAO & MM&PW], 2014). Moreover, this project necessitates a change in land use from residential to commercial and hotel purposes within the urban fabric that will result in a significant displacement of local people.

The initiative presents several issues, including a lack of integration with the surrounding traditional urban fabric and further detachment of the shrines, which are integral to the city, from their historical context. While creating vast open spaces addresses the need to accommodate large numbers during pilgrimage events, their effectiveness diminishes during the rest of the year when it's not as crowded. Similarly, the shift in land use from residential and mixed-use to commercial and hotel spaces results in limited functionality solely during peak periods, leaving them unoccupied for the remainder of the year. Most importantly, the demolition of nearly half of the old city raises significant concerns that necessitate critical examination and consideration of alternative solutions.

This study, therefore, aims to explore alternative strategies for accommodating the increasing number of visitors by conducting a comprehensive analysis of the traditional urban fabric, focusing on its unique characteristics, existing open spaces, land use patterns, and pilgrimage movement, to discover opportunities for redevelopment while protecting its traditional urban fabric.

2.2. Methodology

The research started with a Master's thesis titled "Urban Heritage Conservation Considerations for Developing Urban Spaces in the city center of Karbala" (Al-Ameen, 2023). The study included reviewing relevant literature and analyzing four case studies focusing on critical urban factors: urban fabric, open spaces, urban networks, and land use. Case studies studied for the research were all historic city centers and were the following: The Central Area of Medina-al-Munawara, Urban renewal of Chiado neighborhood, Reconstruction Project of Hafsia, Tunis, and Urban Regeneration in Darb Al Ahmar District, Cairo. Lessons and insights were extracted from these case studies and categorized based on the four factors.

The literature review was conducted using academic databases as well as official reports from the Ministry of Municipalities and Public Works and urban planning documents related to Karbala. The review aimed to answer key research questions: (1) How can historic urban fabric be preserved amidst necessary development? (2) What opportunities does the current city center offer for a balanced development approach? (3) How can the visitor influx be accommodated while protecting the urban fabric?

Furthermore, an extensive analysis of Karbala's city center was conducted, including a detailed study of map information and an analysis of pilgrimage movement patterns during peak and off-peak periods. The study also involved an exploration of the urban landscape, observing and assessing spatial dynamics and changes occurring during the days of the event. The visual representations and sketches done by the author provided a better understanding of the urban context and helped identify existing opportunities. Consequently, the findings were also documented through illustrations, forming the basis for the study's conclusions on the urban development and preservation opportunities within Karbala's historic core.



Figure 1: Methodology diagram (source: by authors)

As shown in Figure 1, this paper aims to identify existing opportunities within Karbala’s old city for applying development strategies that have proven successful in other case studies. These include the reuse of urban areas and built heritage to address key challenges such as accommodating the large influx of pilgrims while conserving the city’s historic urban fabric. The approach builds on lessons drawn from the analysis of Karbala’s city center and adopts a methodology that relies on visual tools, such as drawings and spatial illustrations, supported by a literature review and the study of pilgrimage movement patterns, which is presented in the following section.

2.3. Pilgrimage movement pattern and points of pressure

The urban layout of the old city consists of main routes and axes as well as secondary routes and alleyways. A report by DAO & MMPW (2012) compared the crowd level on the main axis routes leading to the holy shrines during regular and event days and revealed important insights [as seen in Figure 2 (a)].

The report indicates that the southern routes are the most congested on both regular days and during events, highlighting the need for attention. In contrast, the western route experiences the lowest traffic on event days. The northern routes are the second busiest during events, but are the least utilized on regular days. To balance crowd congestion and reduce pressure on the southern and northern routes during events, it is suggested that underutilized routes, such as the western route, be considered as alternative options to disperse traffic.

Additionally, Alrawe and Qasim (2018) studied the movement of pilgrims in the holy city, simulating their patterns [as seen in Figure 2 (b)]. According to this analysis, most visitors mainly take the main axis routes leading to the shrines, causing congestion on these routes. Meanwhile, the secondary routes within the district's urban fabric remain uncrowded even during the events, ultimately disregarding these secondary routes and areas.

Based on their findings, they recommended creating vibrant pedestrian nodes with services in various locations within the city center to enhance open spaces for visitors and locals during regular and event days. This approach would align with the city’s spatial and spiritual identity while reducing congestion around the two shrines. They specifically suggested locating one of these nodes near a key attraction in the city center—the mosque of Imam Mahdi—on its northern side, where a river exists to help establish a distinct urban space.

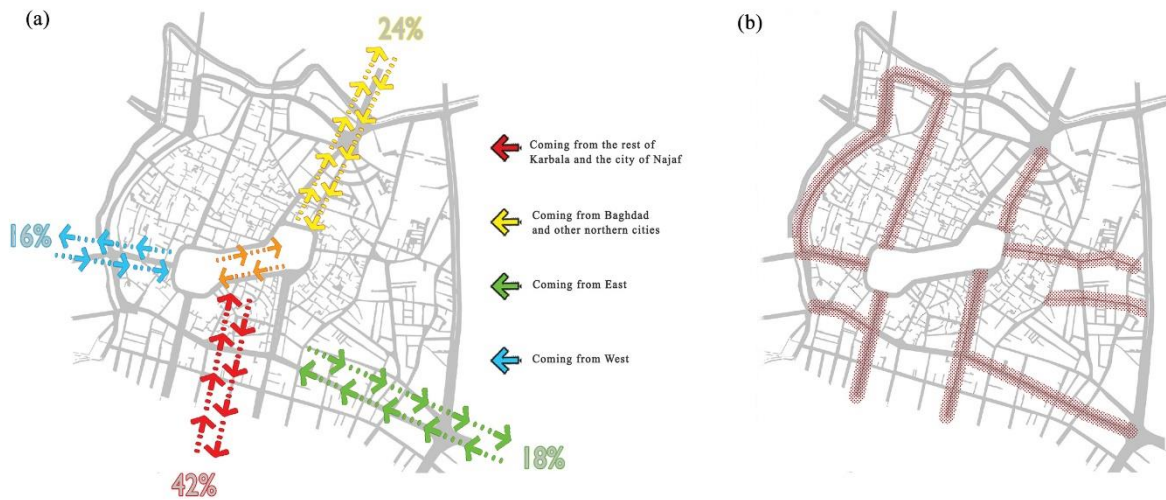


Figure 2: (a) Pilgrims' movement during the Arbaeen, source: DAO & MMPW (2012), (b) Main routes taken mainly by the pilgrims during Arbaeen, (source: By authors based on Alrawe & Qasim, 2018)

3. Identifying the city center's existing opportunities

This section will explore the key assets of the city center and opportunities discovered through a comprehensive analysis. Recognizing and leveraging these assets is essential for addressing Karbala's challenges while preserving its urban heritage.

3.1. The traditional urban fabric

The preservation of the historic urban fabric is a valuable resource for positive change, deeply connected to the area's social and cultural essence. The historic neighborhoods and the traditional communal bonds within are seen as integral assets for the city's future. (Aga Khan Trust for Culture [AKTC], 2005). The urban fabric of the city of Karbala has been known since its formation in 680, with the concentration of residential buildings in a dense and compact fashion. Moreover, it is centrally configured around the two shrines, depicting a spiritual and religious relationship between the occupants and the holy shrines (Farhan et al., 2021). The characteristics of the traditional urban fabric include:

The human scale: The old city's dimensions maintain a suitable walking range of 400-800m from the center to surrounding districts, while the streets and alleyways' human dimension reinforces social connections in addition to providing climatic comfort and privacy advantages. Figure 3 displays sketches of the old urban fabric and the human scale within its spaces.

Social and physical cohesion: The city has achieved urban integration by incorporating key elements of an Islamic city. Muslim cities traditionally emphasize maintaining good neighborly relationships and building houses closely connected, allowing for the integration of individual homes into cohesive urban units. Good neighborly relations thus became a specific form of solidarity, shaping the social and physical fabric of residential districts in Muslim cities (Bianca, 2000). The compact form of houses provides security and climate control while fostering social interaction among residents and strong community bonds. Social networks thrive in familiar historical environments that foster a sense of continuity and ownership (Leite, 1998). Particularly within the old city, the urban fabric is characterized by a Compact Pattern that reflects a homogeneous structure with a historical dimension affirmed by traces of the old city's wall within this fabric's boundaries. This section is considered the oldest in the city and reflects a densely interconnected fabric with a harmonious urban style (Merie and Farhan, 2022).

The transition from public to private: The system of narrow alleyways, internal corridors, and gateways prior to the entrances of individual houses facilitates a gradual transition from public to private areas, which is crucial for urban functionality and cohesion. The urban layout prioritizes clearly defined spaces for private and public uses. The street network is integrated into suqs and residential quarters, and dead-end alleys lead to clusters of private houses. Gates and thresholds create social hierarchies that ensure privacy while connecting urban elements, forming a cohesive communication network (Bianca, 2000).

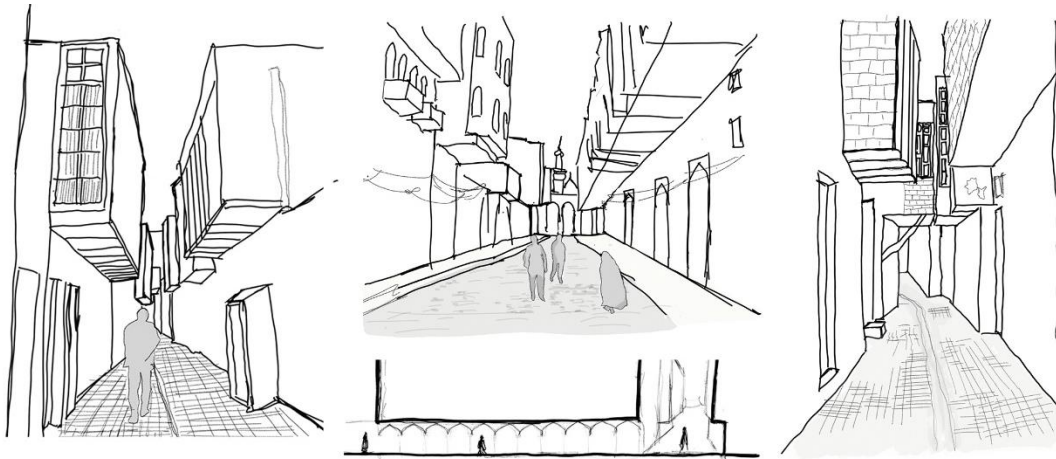


Figure 3: Sketches and sections of the alleyways and streets of the old city (Source: Drawings drawn by the author)

Climatic control: The proportion and narrow shape of the alleyways contribute to climatic control by providing shade and reducing heat exposure during hot summer days while also allowing for a cooler ventilation flow. Additionally, roofed passages further enhance this cooling effect, maintaining a shaded environment that protects against extreme weather conditions. The compact form of houses, the courtyard typology found in Karbala's historic center, and the construction materials all play a role in improving climatic control.

Pedestrian-oriented layout: Particularly within the old city, the routes follow an organic pattern characterized by irregular shapes and dead ends that are not compatible with vehicle movements. Yet, they are more accessible for pedestrians and visitors. Moreover, for security purposes, the central area is predominantly accessible on foot and has limited vehicular access. This condition proves beneficial as it paves the way for a pedestrian-oriented development. Priority should be given to pedestrians and public transportation instead.

3.2. The mixed land use

The traditional Islamic city has historically embraced a multifunctional core, integrating religious, educational, social, and commercial functions (Bianca, 2000). Karbala city center's land use is primarily residential, with 27%, and commercial, with 20% area coverage. The remaining uses include religious services, public spaces, and multi-purpose areas (Merie & Farhan, 2022).

Its layout consists of a religious center surrounded by public spaces and traditional markets, then residential areas extending outward. Historical influences and diverse civilizations have contributed to Karbala's current balance of land use, showcasing features typical of an original Islamic city (Farhan et al., 2018). The areas with prominent residential and mixed-use include the north side, mainly the old district of Bab Al-Taqa, as well as most parts of the east, such as Bab Al-Khan and Bab Al-Solalamah districts. These mixed-use areas not only provide a self-sufficient environment but also contribute to strengthening both the place's identity and its inhabitants (Chantry, 2017).

Unlike the proposed development project that plans to replace residential areas with commercial and hotel spaces, it is crucial to preserve the residential use in the city center. The case studies underscored the significance of residential use in reviving urban areas and preserving a sense of belonging. Moreover, owing to the feeling of inclusiveness, communities residing in these regions are inclined towards participating in initiatives aimed at enhancing their neighborhoods. The preservation of residential use also promotes engagement with the physical environment and fosters natural surveillance, ensuring safety within the area (Chantry, 2017). Moreover, residential use is valuable in Karbala due to the city's traditional host-guest dynamics, with locals historically providing services, accommodations, and hospitality to pilgrims. This annual support from the residents of the old city plays a crucial role in Karbala's ability to host millions of pilgrims each year.

3.3. Attraction Points

The city center of Karbala contains many unique elements and components of everyday life that uphold the city's structure and strengthen its collective memory. The map of Figure 4 delineates the location of potential landmarks such as heritage Buildings, traditional houses, religious destinations, mausoleums, Madrassas, bath houses, local markets, and Khans (traditional guesthouses). These elements carry immense cultural and historical significance for inhabitants. These components play an essential role in shaping both the physical and social landscape of Karbala's city center. Preserving these landmarks and incorporating them into daily life promotes a sense of identity and belonging within people.



Figure 4: Map of the attraction points (source: by authors, based on DAO & MMPW, 2011)

3.4. The existing vacant lands

Many buildings in the historic city have fallen into ruins due to long-term neglect, resulting in numerous vacant and abandoned areas that remain unused to this day. Learning from the case study of historic Cairo, where such plots were treated as opportunities, we can also view them as untapped potential. In a city with a notably high influx of visitors like Karbala and a significant demand for extra space during the special days of Arbaeen, optimizing these underused and neglected plots scattered throughout the historic core becomes crucial.

The map of Figure 5(a) offers a visual representation of the abandoned and underused spaces within the city center, compared with the proposed expansion project's area. This contrast highlights that the opportunities presented by these empty spaces account for approximately 68% of the proposed project area. This suggests that a considerable portion of the planned expansion could be integrated into these vacant spaces, emphasizing the opportunity to repurpose and revitalize existing areas.

The example of Medina al-Munawara [as seen in Figure 5 (b)] further illustrates the consequences of urban interventions prioritizing large-scale redevelopment over heritage preservation. Successive developments around the Prophet's Mosque led to the gradual loss of its historic fabric, culminating in the clearance of its old districts. Similarly, Karbala faces the threat of losing its traditional urban core, highlighting the need for balanced, context-sensitive strategies to protect its historical identity while accommodating growth.

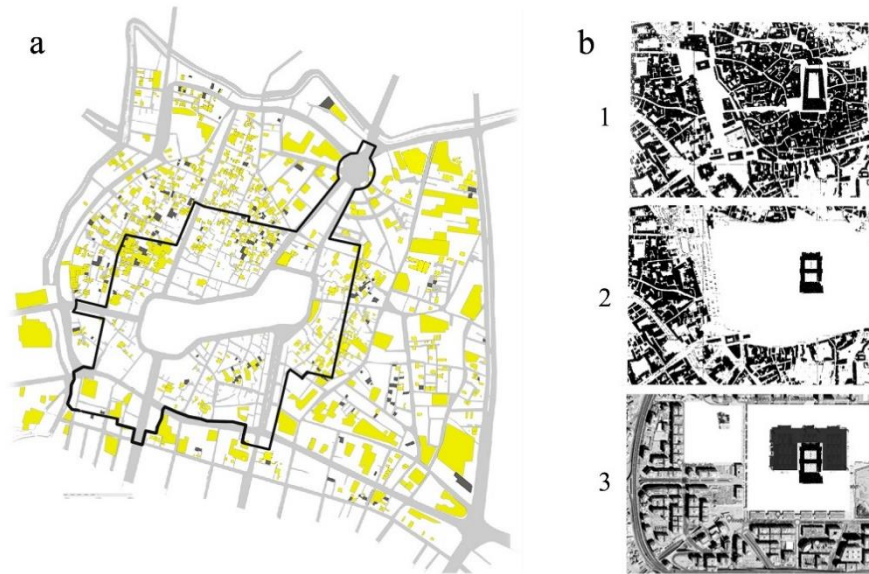


Figure 5: (a) Comparison of open spaces, (b) Medina Central City Development. (Sources: (a) by authors, based on DAO & MM&PW (2011, 2014), (b1 & b2) Bianca (2000), (b3) Google Maps.)

4. Proposed Strategies

In the following section, strategies derived from urban analysis and case studies are proposed in response to the city center's current challenges. These strategies will help the city maintain its urban heritage and revitalize its urban spaces while increasing capacity to accommodate the large number of visitors.

4.1. Restoration and Adaptive reuse of historic buildings

In the study of the cases of the Chiado neighborhood (Leite, 1998) and historic Cairo (AKTC, 2005), the old structures and monuments were restored and then either retrieved their original uses or were given new uses according to a comprehensive restoration plan for the entire area. For example, in the Chiado neighborhood, housing was reintroduced into the 18th-century structures, and the previous department stores were converted into hotels and commercial mixed Uses (Leite, 1998).

And in Cairo, Darb al-Ahmar, historic monuments were carefully restored and often adaptively reused for community and cultural functions, while traditional housing stock was rehabilitated rather than demolished. [See figure 6 (a)]

In Karbala Old City, the historical buildings are neglected and almost forgotten. By restoring and adaptively reusing these structures, they can reclaim their significance, restore identity to the place, and serve as focal points that attract visitors. Preserved and respected for their inherent qualities, the monuments, old buildings, and traditional open spaces must be re-integrated into the everyday life of the residents and reconnected to the area's complex, multi-dimensional social and cultural character (AKTC, 2005).

As a subsequent step, connecting these attraction zones by enhancing the routes between them will create paths that lead people through these places deep within the urban fabric's forgotten areas. This will lead to the revitalization of the areas around the attraction points and, eventually, the whole city center [as seen in Figure 6 (b)].

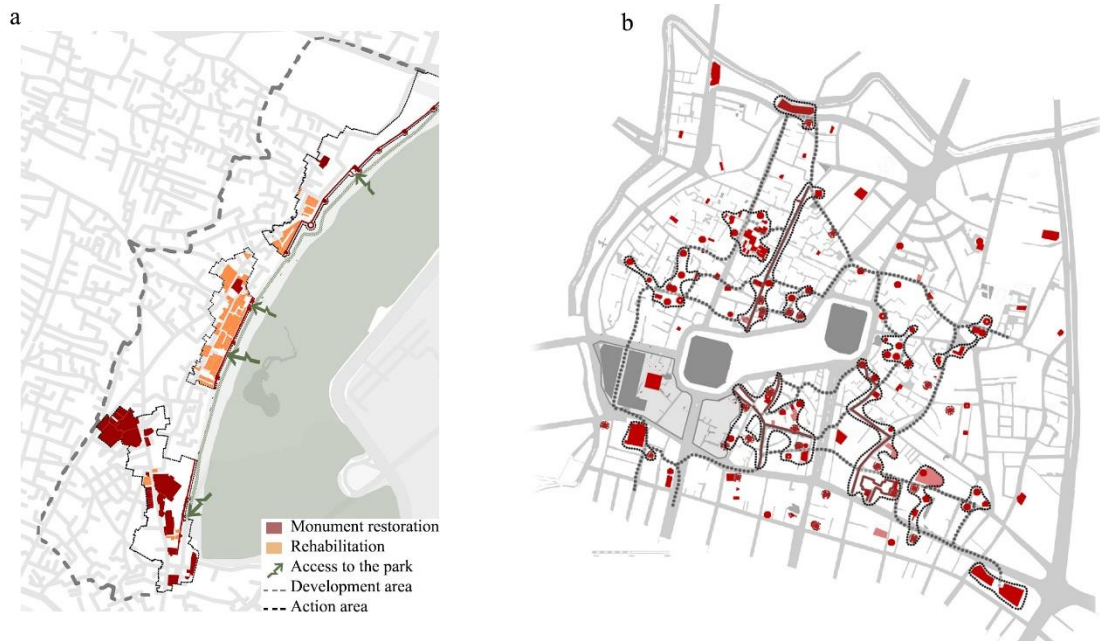


Figure 6 (a): Urban interventions in the Darb al-Ahmar in Cairo, including monument restoration, rehabilitation zones, and linking with the nearby park, (b) Map of Karbala showing the attraction points and the routes linking them. (Sources: (a) By authors using data from AKTC (2005), (b) by authors)

4.2. Repurposing vacant lands into public open spaces

In dealing with vacant open areas within the urban tissue, insights can be drawn from the Hafsia case study. The Phase 2 project had about 28% vacant areas, which underwent a comprehensive analysis to identify spaces for reconstruction and the positioning of new open areas (Aga Khan Award for Architecture 2013). (See figure 7(a)) Similarly, empty spaces in Karbala should be subjected to a detailed analysis to revitalize them and enhance their utility.

For example, these underutilized areas could be transformed into vibrant public spaces, serving as gathering places for social interactions and enabling pilgrims to congregate and perform their rituals. Rather than destroying the urban fabric to create vast open spaces, which disrupt the established urban structure as suggested by the proposal project, a more effective strategy involves introducing multiple smaller open spaces seamlessly integrated into the urban fabric and utilized throughout the year. The experience of Medina (Bianca, 2000) also shows that vast open areas are only useful for accommodating crowds during peak periods; on regular days, they remain uncrowded, making the walk to the shrines harder and less enjoyable, especially during the day.

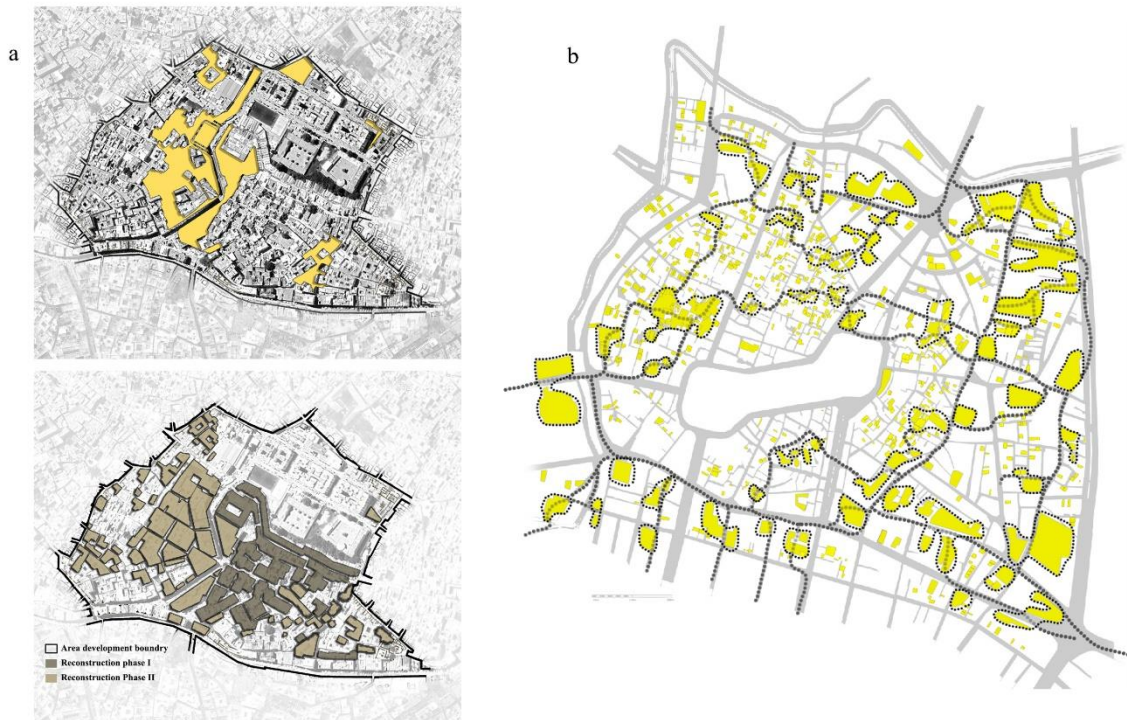


Figure 7 (a): Hafsia, redevelopment of empty spaces, (b) Underused areas connected. (Sources: (a) By authors using data from AKAA (2013), (b) by authors)

These open spaces can serve as pedestrian nodes and could be connected and made more accessible through existing routes. This would lead to a redistribution of visitor pressure across the city center and could present opportunities for the development of the entire city center while being integrated into the urban fabric, as seen in Figure 7(b).

To further support this vision, a layered spatial analysis was conducted to pinpoint specific zones where such interventions could be most effective. Figure 8 shows how layering multiple datasets, such as maps of historical attractions and distributions of empty spaces, can help identify areas with potential for development and enhancement of public spaces. By visualizing these intersections, the figure provides a strategic basis for proposing targeted revitalization that considers both the functional needs and the historical context of the city.



Figure 8: A map of overlapping data that will reveal more opportunities for developing and revitalizing the city center (Source: By authors)

4.3. Temporary adaptation

Considering how Karbala transforms during the annual Arbaeen event, it is crucial to prioritize flexibility and adaptability in urban uses. During Arbaeen, the city's streets and public open spaces are transformed with temporary installations to serve the influx of visitors with customary food and drink services and provide temporary accommodations.

This adaptability and multifunctionality also existed in the traditional Islamic city, where the mosque was designed to be a permeable structure, accommodating multiple uses and large congregations. Bianca (2000), in his proposal for the expansion of the Grand Mosque of Medina-al-Munawara (Case study 1), aimed to maintain this multifunctionality with flexible ground floor plans that could be used for prayer during peak seasons and for informal commercial activities during other times, ensuring the central area remains vibrant and functional year-round.

Building on these practices, public edifices, endowment buildings, and educational facilities can play a vital role. (See figure 9) For instance, schools occupy large areas that remain unused during event days, making their extra space highly valuable for meeting the increased demand during these special times. This adaptability can also be applied to other significant buildings in the city center, particularly those with ground floors accessible from the main street. They can be temporarily adapted to accommodate installations that serve pilgrims, which would otherwise occupy a significant portion of the streets, hindering the flow of visitors. This approach would alleviate street congestion and ensure a smoother flow of pilgrims through the city while also helping to reduce the strain on local residents.

By implementing this temporary adaptation approach, Karbala can better accommodate the influx of pilgrims during the event and enhance their experience while preserving the integrity of its urban fabric and maintaining the city's functionality year-round.



Figure 9: Public buildings in the old city (source: drawing by authors based on DAO & MMPW (2011))

4.4. Reviving existing old routes

Reuse and rehabilitating existing routes, especially the old routes within the urban tissue, with their historical dimension, will lead people from the main axis roads into the historic urban fabric, encouraging exploration of other aspects of the old city, including its historical attractions, social, and cultural life, ultimately leading to the revitalization of the neighborhood. Reintroducing these neglected paths can help alleviate the pressure on the city core and redistribute it across the city center. Currently, most visitors use the main roads with direct access to the shrines, leaving older routes within the urban districts uncrowded even during peak periods (Figure 2(a)).

Moreover, the proposal plans for the city center's development have also suggested improving some of the older routes and introducing others to improve the flow of visitors.

4.5. Targeted intervention

In the case of Historic Cairo (AKTC, 2005), abandoned residents, ruins, and buildings in poor structural condition were considered opportunities for new developments. Small-scale interventions targeting these areas for re-purposing and redevelopment could, in turn, transform the area surrounding them. The same strategy can be applied to the city center of Karbala. This approach will eventually lead to revitalization and increased capacity and density without destroying the city's urban tissue.

4.6. Reuse of existing structure

Steinberg (1996) suggests that the primary emphasis of reusing buildings should be on upgrading and adapting them to serve contemporary functions and activities within a comprehensive plan to enhance the surrounding area. For example, in the revitalization of historic Cairo (AKTC, 2005), many existing structures adjacent to public spaces and monuments were repurposed for new uses to serve tourists and the community. Additionally, the rooftops of buildings were rehabilitated and reused for restaurants and cafes. Similarly, structures were adapted for new uses in the Chiado neighborhood (Leite, 1998).

The same approach could be applied to Karbala's city center. Buildings in good structural condition can be repurposed according to the area's requirements and the pilgrims' needs. Connected rooftops of these structures could turn into public spaces with clear views of the holy shrine. During peak periods, they can serve as gathering spaces, enhancing the spiritual connection through visual connection (See figure 10). Efficiently utilizing existing structures to provide extra space for crowds can avoid disrupting the established urban fabric.

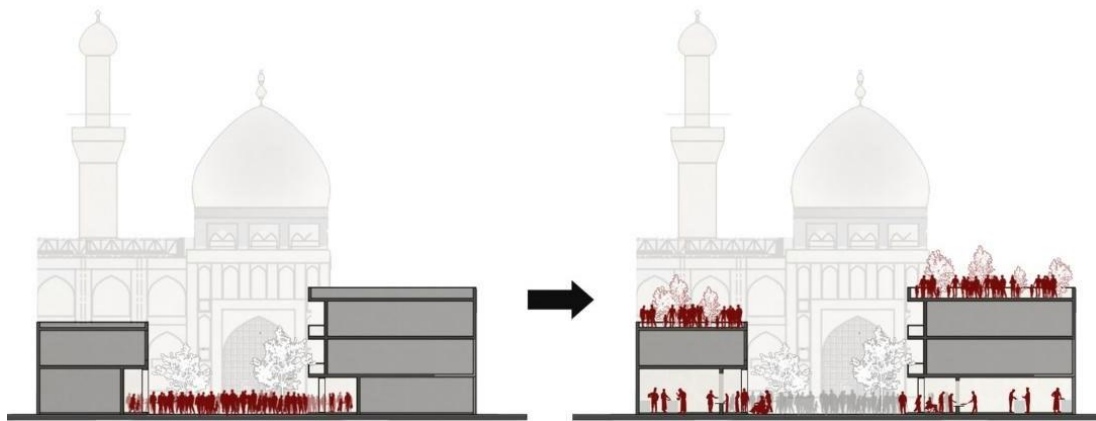


Figure 10: Activating the existing structures around the shrines by repurposing their spaces to serve the crowd during the event (Source: Illustration by authors)

5. Result

The study highlights that the old city possesses a strong foundation for preserving its urban character. It notes that Karbala's current urban fabric holds untapped potential, with several underused spaces that could be leveraged for better crowd management and service distribution. Strategic interventions, such as repurposing vacant spaces, enhancing pedestrian pathways, rehabilitation and adaptive reuse of structures, and revitalizing underutilized areas, can address visitor demands while preserving the city's historical integrity. (See figure 11 for reviewing the suggested strategies.) This approach offers a more sustainable alternative to large-scale demolitions and new developments, as well as ensuring the city's functionality year-round.

The result also shows that many successful strategies in other city centers can also be applied to Karbala. However, what makes Karbala's city center different from other cases is the temporary transformation of its urban spaces during the event, which necessitates a focus on adaptability and flexibility in using urban spaces. Therefore, two types of reuse strategies were suggested: Adaptive Reuse and Temporary Reuse.

By temporarily reusing existing structures and spaces during the Arbaeen event, Karbala can effectively accommodate visitors' needs and enhance their experience while preserving its historical fabric. Temporary reuse can provide

necessary accommodations and services for pilgrims, while adaptive reuse revitalizes underused areas of the city center. This approach enhances the city's livability, preserves its heritage, and maximizes its capacity to absorb the flow of visitors.

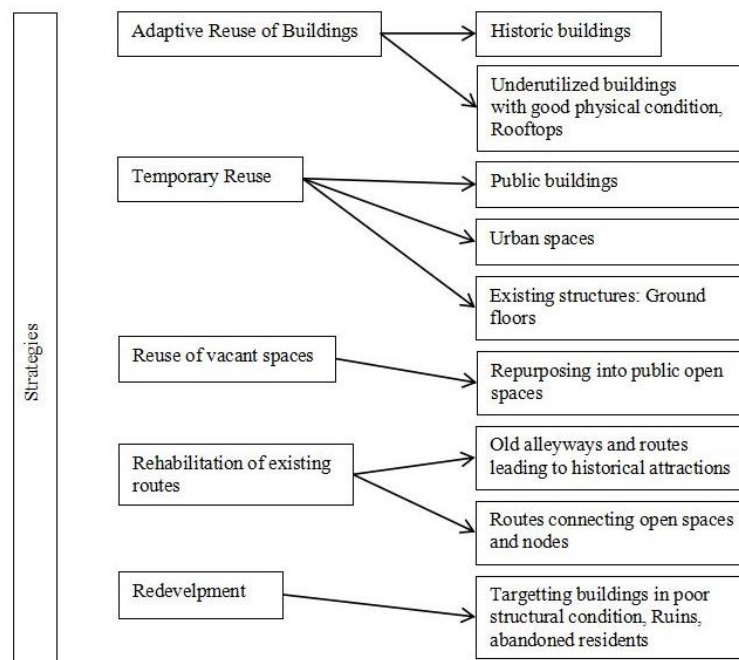


Figure 11: A diagram of the proposed strategies (source: By authors)

6. Limitations and Future Implications

If effectively implemented, the proposed strategies could serve as a model for other historic cities facing similar challenges. Additionally, integrating these strategies into urban planning can promote a more sustainable and resilient city center, balancing the needs of residents and pilgrims. However, the long-term success of these strategies will depend on supportive policies that incentivize preservation, private-sector investment, community engagement, and continuous data-driven urban management to adapt to future challenges and demands.

Regulatory constraints could pose challenges, as urban planning policies may not fully support Adaptive reuse or Temporary reuse of existing structures. While preserving Karbala's historic fabric is a priority, local communities and businesses may have different interests, such as expanding economic opportunities or modernizing infrastructure, which could affect how these strategies are received.

Future research should focus on practical implementation pathways for the proposed strategies. Additionally, exploring methods for expanding the shrines in a way that respects the urban fabric and minimizes disruption, as well as exploring the temporary reuse of buildings during the Arbaeen event, would be valuable areas for further study.

7. Conclusion

The current city center of Karbala presents many opportunities with its traditional layout and mixed-use areas that contribute to the city's social and cultural fabric. It is essential to safeguard this authentic urban layout and its distinctive elements to uphold Karbala's identity while addressing the massive influx of pilgrims. However, the current development initiative fails to consider and integrate with the surrounding context, focusing on functionality during peak periods at the expense of the historic urban fabric.

Instead, the research proposes a methodology that involves analyzing the urban fabric, identifying existing assets and opportunities, and exploring possible strategies for intervention. The strategies are supported by insights from similar case studies and selected based on the analysis. This demonstrates a practical approach to addressing the city's challenges while protecting its valuable urban tissue. The study advocates for effectively utilizing the current assets

of the city center and directing the development toward the entirety of the city center rather than focusing solely on the areas around the shrines.

Karbala's city center remains vibrant and functional despite challenges and partial destruction, mainly due to housing the shrines in its heart. The annual event, crucial to Karbala's identity, relies on the hospitality and dedication of its residents. Protecting the traditional urban fabric intimately connected to the people and the shrines is essential. A rehabilitation project that benefits both residents and visitors and uses the suggested strategies is necessary to preserve the city's unique identity while accommodating the influx of pilgrims.

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Ethics Approval

Not applicable.

Conflict of Interest

The authors declare there is no conflict.

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