The role of religious monuments in restructuring the movement systems in the Wadi Al-Salam cemetery

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Abstract. The holy city of Najaf is a shrine for Muslims from all over the world due to the presence of the Holy Shrine of Imam Ali Bin Abi Talib, the cousin of the Prophet Mohammed (PBUTh), and the Wadi Al-Salam, the Valley of Peace, cemetery, which includes shrines to many Prophets, righteous people, scholars and righteous martyrs. The Holy Shrine of Imam Ali (PBUH) is the most prominent monument, being the factor around which the urban fabric of the city was formed and established. The form of the cemetery has thus developed with the urban fabric of the city, and it includes many religious monuments that attract thousands of visitors and pilgrims from both within and outside of Iraq. Due to this cumulative growth of the cemetery and the irregularity of its axes of movement, the movement of visitors inside the cemetery has produced several design, planning, and security challenges as it has begun to affect the urban fabric of the city and the cemetery itself. Movement and visual interconnections between vital monuments of the religious figures have thus been restricted by the fabric of the Wadi Al-Salam Cemetery at both micro and macro levels, generating the current research problem. Accordingly, this research aims to set to explore the possibility of restructuring the movement system of the Wadi Al-Salam Cemetery based on its monuments. The research assumes that the texture of the cemetery can resemble the fabric of the city in terms of adopting the presence of religious monuments to structure spaces. Consequently, the importance of monuments in terms of defining systems of pedestrian and vehicle movement within the fabric of the city was studied to determine the list of indicators classifying the possibilities provided by such monuments according to their historical and religious significance. With regard of the cemetery, several monuments of historical, religious, and contextual significance were then chosen as key points in the restructuring of the local movement systems. The overall research conclusion is that it is important to reconnect these monuments by developing an organic network of movement in order to preserve the graveyards and the historical fabric of the cemetery.

Keywords: urban cemeteries, religious monuments, Wadi Al-Salam cemetery, the movement's system, the holy city of Najaf

1. Introduction
Cemeteries have existed for thousands of years in cities and urban areas, though the holy city of Najaf is distinguished by having the largest cemetery in the world, which was originally located outside the boundaries of urbanisation yet visually linked with the Holy Shrine of Imam Ali (PBUH). Burials are carried out there of people from all across Iraq, as it is used as a public cemetery for the Shiite community both in Iraq and outside Iraq. Due to population growth and urban expansion, it has become intertwined with the urban fabric of the city, and today, the Wadi al-Salam cemetery is considered to be within the body of the city. However, it lacks permeability and clarity with regard to space organisation, with a
lack of flexible movement systems to allow people to reach the graves, and a lack of spaces for visitors, which means that the cemetery has begun to negatively affect the city due to the shrines and monuments to saints, righteous people, scholars, and martyrs that are distributed across the cemetery's fabric, and which act as points of attraction for visitors throughout the year. The research problem for the current work is thus the disconnection between the movement and visual axes connecting these vital monuments in the fabric of the Wadi al-Salam cemetery at both micro and macro levels. The aim is to explore whether by considering these religious monuments, the movement system in the cemetery can be restructured without affecting the historical fabric, allowing these monuments to become more physically and visually interconnected, allowing them to better symbolize collective historic memory and to support the social fabric of the city. To achieve this, this research assumes that the texture of the cemetery is similar to the fabric of the city in terms of the adoption of religious monuments to structure spaces.

2. Literature review: the importance of urban monuments in structuring urban fabric

2.1. Al-Saadawi and Al-Hinkawi, 2020: Role of urban malleability mechanisms on sustaining cities

In their study, Al-Saadawi and Al-Hinkawi explained that the most important mechanisms of urban resilience where the restructuring and increased interconnectedness of the urban fabric. They pointed out that this could be done by grouping urban spaces into a continuous and connected line, based on documenting and engaging buildings of distinctive value within such a fabric. These researchers suggested transforming such buildings into nuclei of attraction, allowing them to act as focal points to redefine the urban fabric and add value to the existing elements, with the aim of restoring the cohesion of the urban structure, and enhancing the sense of place and time [1].

2.2. Farhan, Akef, and Nasar, 2020: The transformation of the inherited historical urban and architectural characteristics of Al-Najaf’s Old City and possible preservation insights

In their study, these researchers discussed various visions for preserving and restructuring the urban fabric of Al Najaf. They proposed a set of steps to reach these visions, with the first step being to highlight the importance of religious monuments, as represented by the Holy Shrine of Imam Ali (PBUH), in developing cohesion of the urban fabric. The second one referred to work to visually reinforce the Shrine's dominance over the skyline and to preserve the historical features remaining in the fabric. Stimulating levels of awareness among visitors and the local population with regard to the importance of linking religious signs was the third step, and the importance of community involvement in this conservation process was also highlighted [2].

2.3. Al-Mamouri and Al-Abadi, 2017: The role of religious event monuments in urban development based on an Al-Taff event case study

In this study, the researchers indicated that religious monuments have a clear physical and moral effect, and they should be treated as intellectual morphological schema and read as both physical and moral sequential panoramas, as they are the main centre points of movement in the urban fabric. Religious monuments contribute to organising the morphology of the fabric by centring activities, and thus play an important role in forming the mental plans of the movement used by visitors and directing their movement through their visual treatments of space and mass organisation, including their uniqueness, clarity of boundaries, simplicity of formation, lack of decorations, continuity of elements, and the connection of mass to space. In addition to the clarity of such monument’s visual range, adding urban spaces and urban nodes around them can facilitate scenes of ritual display. Monuments create an imprint on the urban fabric through their spatial positioning and expand into surrounding spaces in terms of perception. Monuments are inherently local elements that work to link and integrate the totalitarian structure of the fabric by highlighting historical characteristics, facts, and events. Monuments also form the urban fabric based on the interconnectedness of the buildings in a sequential manner, and the continuity the sequence of access and containment offers. The monuments offer an intellectual presence beyond their physical presence, enhancing identity and offering a sense of
belonging, including strengthening social relations and ties, strengthening the rituals of visitation, and enhancing heritage elements during events [3].

2.4. Al-Hanakawi and Saeed: The Characteristics of Contemporary Monumental Buildings in Al-Najaf Holy City: a case study.

The authors referred to the role of the monument in creating urban identity through achieving communication and reminding people of events; a monument’s name and history are generally unforgettable, which enhances the collective memory for the area and increases the number of visitors and tourists seeking learn about their culture and traditions. Monuments also reinforce physical identity by means of symbols, thus enhancing the distinctive personality of the urban fabric. Monuments are perceived most clearly when they are visually contrasted with their surroundings, being both unique from and integrated with the surrounding fabric, making them more easily seen. The researchers added that monuments are of great importance in reconnecting various parts of the urban fabric, offering flexible connections with the main transport networks, easy access to urban features, and dominance of the horizon line, achieving a space gradient within the context and forming distinct points within space. The allocation of monument buildings and features within the most connected and permeable spaces offers clarity and thus leads to a better understanding of the urban fabric’s structure. Also, the location of monuments on sites crossed by axes of movement or vision also increases their semantic weight in the urban fabric [4].

2.5. Nasar, 2015: The Influence of Sacred Shrines on Directing the Movement Axes within the Urban Fabric of Islamic Holy Cities: An-Najaf Al-Ashraf as a case study.

This research indicated that religious shrines have an effective and influential role in directing movement axes in the urban fabric based on the directivity and axes of these religious buildings. Directivity is the default line connecting two points, while interconnection may be considered either at the level of the intellectual (emphasising spiritual and ideological interconnections) or physical (by directing the street or arranging buildings in a specific format and creating an interconnected series of buildings that define the interface of the axis). The concept of axially applies to paths defined by architectural elements (spaces or buildings), and straightforwardness is thus not required, although directionality is the basis for its formation. The researcher also added that the dominance of religious buildings is formal, enforced through the presence of the dome and the minaret, or by the distinction of location, or by being on the largest block; all of these play a role in pulling axes towards such a building and directing all movement towards it. Urban landmarks create significance in the urban environment and develop the urban landscape through defining the path of the axis, based on the landmark, the surrounding content and the street width. Finally, the researcher concluded by noting that movement axes are among the most important physical factors stressing directionality [5].

2.6. Al-Dahwi and Alwan, 2015: Impact of Tourism Attractions on Authenticity and Urban Identity: A Case Study of Tourist Religious Landmarks

The researchers pointed out the importance of having clear axes leading to monuments and linking these to public transportation systems, alongside the provision of parking lots for each monument. The study emphasised the importance of monuments within the urban fabric by focusing on the regulation of the movement axes and the identification of the street edges with elements of shading such as trees and roofs, as well as the development of lighting systems that do not conflict with the general lighting of the streets while increasing the level of lighting on urban monuments [6].

2.7. Niazi, Al-Atabi, and Al-Abbasi, 2014: The Effect of Religious Monuments in the Plan of the Arabian Islamic city: Samarra City, a Case Study.

These researchers discussed the importance of religious monuments in the creation of mental pictures of the structure of the urban fabric in people's memories, with monuments distinguished by a formal appearance that is constantly present in the minds and memory of inhabitants and visitors. Monuments
thus play a distinct role in directing spatial connections and generating integrated areas with high permeability [7].

2.8. Böcekli, 2003: Investigating the Effects of Nodes and Landmarks in City Planning Practice.
This study described monuments as tangible speakers and attractive elements of various sizes that reflect the life of the community. They increase the possibility of imagination, perception, identity, direction and finding the way, as they are both the most dominant and contradictory elements within the environment; alongside the elements around them, they are not additional components but instead as necessary to the urban fabric as transport systems. The aim is to modify the transition between the main design elements and urban elements, to help people orient themselves in the urban fabric and to let them get to know the area. Monuments act as reference points in the city, making journeys easier and more familiar, and creating a more memorable urban fabric. Monuments also reflect historical events and famous leaders, and thus facilitate a social reading of the structure of their society [8].

3. Wadi al-Salam cemetery and its problems:
Wadi al-Salam cemetery has passed through multiple morphological stages, beginning with burials next to the honourable mausoleum in Imam Ali’s (PBUH) Holy Shrine, and spreading via burials outside the wall of the old city as the cemetery began to take shape in an irregular, organic manner. With the passage of time and the succession of these morphological stages, as well as the continuous wars since 1980, the cemetery has grown rapidly, remaining irregular and unplanned. Various political and economic factors have also had impacts on the fabric of Wadi al-Salam cemetery. In 1991, during the populist uprising, the authorities removed and demolished several graves, paving roads to facilitate the crossing of the army’s vehicles at that time; most paths there remained narrow, unpaved, and one-directional, however. After 2003, a large number of graves were removed, near Thawrat Aleshryn Square, with the area converted into a bus station for internal transport, along with the creation of open spaces (parks) [9]. Although the construction of straight streets in the organic fabric of the cemetery facilitated the movement of some visitors towards the graves, this has led to contradictions between the network system developed for transport and the organic system underlying the growth of graves. Most of the streets that were carved into the cemetery have also become crowded and unable to absorb the great mass of visitors and pilgrims, with most of them being narrow and unpaved [9].
The organic growth of the cemetery and its axes has led to the blockage of various irregular and organic streets. Over time, as the cemetery began to grow at a very rapid rate in conjunction with the population growth, the number of visitors also became much greater than in the past, and new focuses of attention began to appear that were targets for these visitors because of their special religious and social status. Consequently, previous movement systems lost their efficiency and effectiveness in the face of accommodating a large number of visitors and the increasing interconnections between the areas of growth in the cemetery. Visitors seeking to visit the monuments and religious shrines in the cemetery frequently become lost in the labyrinthine ways to reach these shrines, due to the paucity of signs, the density of the graves, and the lack of paved roads. The current research idea is thus derived from the very real problems that the Wadi Al-Salam Cemetery suffers from, which include loss of clarity and interconnectedness in its texture. As such, the research aimed to determine the most important strategies for visually or physically linking the urban fabric of the cemetery through addressing the important features of its religious shrines and related events. To achieve this goal, the researchers examined several related urban studies to identify the most important indicators that might also be applied to the fabric of the Wadi Al-Salam cemetery [9].

4. Research Methodology
The current research started by considering the main problem that the Wadi al-Salaam Cemetery suffers from, namely the loss of clarity and connectivity in its texture and the obstacles to ease of movement systems between the grid network of the transport system, on one hand, and the organic system of growth in the cemetery on the other hand. This was developed as the research problem, which stipulated the
loss of the movement and visual connection between the important monuments to religious figures in the fabric of the Wadi al-Salam Cemetery at both micro and macro levels. To address the research problem and to achieve the research objective, the following steps were the adopted:

1. Investigating the cemetery and its historical establishment.
2. Building a theoretical framework with regard to role of the monuments in structuring the cemetery's fabric.
3. Achieving the formulation of a plan for the restructuring of the cemetery based on the key monuments identified.

4.1 Data Collection Methods
In order to address achieve the research goal, the following methodology and steps were adopted: an introduction to Wadi al-Salaam Cemetery, its historical origins, and its most important urban issues was developed, thus defining the basic research problem. After that, previous urban studies were examined to determine the most important indicators that could be applied in order to address the problem of the fabric of the Wadi al-Salaam Cemetery, and in particular the religious monuments in the cemetery fabric. A theoretical framework defining the role of these monuments in structuring movement in the cemetery fabric was then constructed to support the practical study. These steps allowed the formulation of a plan for a movement system based on the restructuring of the cemetery according to the features of the selected monuments. Table 1 represents the theoretical framework based on the previous studies, which thus tries to examine and investigate three main vocabularies: Kinetic coherence, Visual coherence, and Sensory or moral coherence.

4.2 Measurement methods and tools,
The information required for the practical study was data from and maps of the study area gathered from relevant governmental and non-governmental authorities and departments. After that, a field survey and inspection process were conducted, including site visits to the study area. The aim of these activities was to see how measuring the indicators of movement and visual interdependence according to the theoretical framework table drawn from previous studies could best be adapted. Analysis forms were utilised for this, based on adopting the theoretical framework indicators to analyse the movement interconnections and the visual correlation indicators observed, allowing evaluation by the researchers based on field visits, in addition to analysis of the relevant charts within the limits of the measures and indicators of the theoretical framework using descriptive analysis.

In terms of measuring the indicators of the moral dimension, the moral coherence in the cemetery fabric was intended to be measured through a questionnaire form; unfortunately, the researchers were unable to conduct this step and distribute the questionnaire form directly to visitors and pilgrims at this time due to the current COVID-19 pandemic.

Table 1. The theoretical framework.

| Main vocabulary                  | Possible variables or values                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------|
| Kinetic coherence                | Ease of access to urban monument, Connecting the monument to public transportation systems and expanding them |
|                                  | Flexibility and connection with the main road network                                        |
|                                  | Parking for each monument                                                                   |
|                                  | Lighting poles with streetlights                                                             |
|                                  | The presence of clear axes leading to the monument                                           |
|                                  | Defining and determining paths with shading elements such as trees and roofs                |
| Directivity                                                                                     | Expanding the spaces surrounding monuments to improve perception (clarity of the monument's visual range, adding urban spaces and urban nodes around them to stage ritual displays) |
| Directing the streets or arranging buildings or elements in a specific order to create interconnected chains of blocks |
| Organising the motion axes within the cemetery fabric according to the monuments               |
| Achieving space gradients within the context to form distinct points within space                |
| Emphasising the dominance of the monument by distinguishing its position                        |
| The role of the monument in increasing the clarity of the fabric                               | Locating monuments within the most connected and permeable axes and spaces to clarify and contribute to understanding and knowledge of the structure of the fabric |
| Directing visitors’ movement so they get to know the area                                      |

| Visual coherence                                                                                          | Creating an interconnected series of monuments, to develop continuity through the sequence of access and containment. |
| Pulling all axes towards monument to achieve dominance within the horizon line                        |
| Increasing the ease of seeing monuments from far and near through emphasising the dominance of the monument or its contradiction with the context |
| Configuring the urban landscape by axis paths, landmarks, contents, and street views                  |
| Enhancing the mental diagrams of movement among visitors within the fabric, directing their movement through visual manipulation of space organisation |

| Sensory or moral coherence | Contributing to visitors drawing a mental picture of the fabric structure |
| Achieving communication and reminding people of events: the name and date of the monument are memorable to the public, and enhance collective memory |
| Increasing the number of visitors and tourists learning about their cultures and traditions          |
| Adding texture reference points to make the journey easier and more familiar                        |
| Identity enhancement                                                                                   | A sense of belonging, strengthening relationships and social bonds and enhancing awareness of the rituals of visitation |
| Borrowing symbols, reinforcing the fabric's distinctive character                                      |
| Using special elements for event monuments that reflect community life                                |
5. Introduction to the study area

5.1. Wadi Al-Salam Cemetery

The Valley of Peace is located to the northeast side of the old city of Najaf, and it is one of the widest and largest cemeteries in the world. It dates to the identification of the shrine of Imam Ali (PBUH) in the year 170 AH, and the cemetery includes the shrines of many prophets, such as the Prophets Hud, Hood, and Saleh, Salih, (PBUTh), and a large number of graves of righteous saints, scholars, kings, and the general faithful, as shown in Figure 1. As a result of the many stories about the merit of burial in the Wadi al-Salam Cemetery, Muslims have attempted for more than a thousand years to transport the bodies and remains of their dead from all over the world to the Wadi al-Salam Cemetery (Valley of Peace), [10]

The original burial area, which was called Dhahr Al-Hirah, the backside of Al-Hirah, dates back to pre-Islamic times, and many prophets and righteous people, as well as the kings and leaders of Al-Hirah [11], were buried there. After Imam Ali (PBUH) was buried in this area, Muslims began to seek to bury their dead next to the Commander of the Faithful (PBUH) and to seek intercession and blessings in the shrine of Imam Ali (PBUH). This led to the emergence of the well-known Grand Cemetery of Najaf, in the Wadi of Al-Salam [12], in which more than 500 known people are buried, including companions, kings, sultans, princes, and similar figures [9].

5.2. Movement inside the cemetery

The movement and transportation systems within the Wadi Al-Salam Cemetery suffer multiple problems and obstacles that are particularly pressing during pilgrimage and holiday seasons. Most of the visitors are forced to walk to reach the graves of their relatives, despite the diversity of transportation means inside the cemetery (private cars, taxis, some traditional means of transportation, and auto rickshaws that visitors’ resort to because of ease of movement, flexibility and cheap fares). The reason for these problems is that the traffic systems and the streets available are not commensurate with the great growth in the cemetery in recent years [9].

5.3. The road network of Wadi Al-Salam Cemetery

Wadi Al-Salam Cemetery is surrounded by a group of roads that links the cemetery with the rest of the holy city of Najaf by means of a network of roads spread across the city. The road network inside the Wadi Al-Salam cemetery itself consists of a group of distributed main roads which are generally paved, with branch roads that spread from them, dividing the cemeteries into blocks. Of these, while some are in regular shapes, many others are irregular (organic), especially in the area nearest to the old city. The map in Figure 1 shows that the largest percentage of these secondary streets are unpaved, and this causes difficulty for vehicles moving within the Wadi al-Salam Cemetery [13].

5.4. Entrances to the Wadi Al-Salam Cemetery

The Wadi Al-Salam Cemetery has several entrances distributed around all sides, as shown in Figure 1. Some of these are main entrances and others are secondary; some entrances are closed throughout the year to the entry of vehicles and allow the entry of pedestrians only, especially the entrances closest to the old city, and vehicles are also completely prohibited from entering the cemetery on holidays and during peak times [13].

5.5. Shrines and monuments in Wadi al-Salam Cemetery

There are many shrines and monuments in the Wadi al-Salam Cemetery, and these make it a destination for a large number of Muslims from within and outside of Iraq. Among the most prominent shrines and monuments in the cemetery are

5.5.1 The mosque of Imam al-Mahdi (may God hasten his relief): this is located generally south of the Cemetery of Wadi al-Salam near the old city; a dome of stucco and stones was built over the shrine and there is an arched stone on it with the date of the visit of the imam, 1785 CE, written on it. Inside the
shrine is the tomb of Imam Jaafar al-Sadiq (PBUH) and a well. The shrine occupies an area of 200 m² and is connected to the main distribution street by a narrow side street, which is about 230 m long, as shown in Figure 1. [14] [17]

5.5.2 The shrine of the Prophets Hud and Saleh (PBUTh): This shrine is located south of the cemetery, near the old city of Najaf, next to the mosque of Imam al-Mahdi (PBUH). It is topped by a green dome [15] and visited throughout the year. The area of the shrine is estimated to be 750 m², and the construction of the shrine was renewed in 2005 [14]. The shrine is linked to the main distributed street, which divides the southern portion of the cemetery into two parts, by a secondary street of approximately 85 m, as shown in Figure (1). Visitors to this shrine generally come on foot after they visit the shrine of Imam Ali (PBUH), entering the Wadi al-Salam Cemetery by passing through Al-Sheikh Tusi street, after which they visit the shrine of the Prophets Hud and Saleh first and then go on to the mosque of Imam Mahdi (may God hasten his relief).

5.5.3 Safi Safa al-Yamani Shrine: This shrine is to one of the good men buried in the Wadi al-Salam Cemetery, known as al-Yamani; high shrines were built for several such men, which people visit to receive blessings [15]. This man’s body was brought from Yemen to be buried in the Wadi al-Salam cemetery, and the shrine is located near the shrine of Imam Zainul-Abidin (PBUH). The area of the shrine is currently 200 m² [16] [18]. Due to the proximity of this shrine to that of Imam Zainul-Abidin, pilgrims generally visit the shrine and the monument together, walking after completing a visit to Imam Ali (PBUH) and passing by the street surrounding the Fatima (peace be upon her) Sanctuary, about 400 m away.

5.5.4 The shrine of Imam Zainul-Abidin (PBUH): This shrine is located next to the shrine of Safi Safa al-Yamani, west of the Haidari al-Sharif, at the southwestern end of the cemetery, as shown on Figure 1. People visit this shrine repeatedly, and it is said that Imam Zainul-Abidin (PBUH) stayed there during his visit to the shrine of his grandfather, Imam Ali (PBUH). The shrine overlooks the Najaf Sea, and covers an area of approximately 1425 m² [15].

There are also many shrines to religious scholars and martyred leaders who have had an impact on the modern history of Iraq; some of these shrines have also become centres of visitation for people, and the most prominent of these include

5.5.5 The shrine of the martyr Muhammad Baqir al-Sadr: This shrine is located in the southeast of the Wadi al-Salam Cemetery, on the edge of the cemetery, on the eastern side [9] next to Karbala-Najaf Street; it is surrounded by the main streets on four sides, as shown in Figure 1. Access to the shrine is thus easy, yet the shrine to the martyr Muhammad Baqir al-Sadr (Holy his honourable secret) is now considered one of the most important shrines in the country, due to its religious and social status. The building was designed in the Islamic style with Abbasid arches and is surrounded by a fence 1,850 m long and 3.5 m high, while the interior space contains streets extending 3,000 m. The shrine was opened to visitors coming on foot to visit holy Karbala on the occasion of the fortieth anniversary of Imam Hussein (PBUH).

5.5.6 The shrine of the martyr Muhammad Muhammad Sadiq al-Sadr: This shrine is located in the middle of the Wadi al-Salam cemetery, as shown in Figure 1, on one of the main distribution streets directly connected to one of the main entrances to the cemetery at the eastern side; the distance between the entrance and the shrine is about 1 km, and the main path leads to the shrine [13]. This shrine is visited by large numbers of visitors daily, particularly on the anniversary of his testimony, and congregational prayers are held there daily. The shrine is surmounted by a green dome, and there is an open courtyard in front of the shrine [13].

5.5.7 The shrine of the martyr Abu Mahdi al-Muhandis: This shrine is located in the northeast of the Wadi al-Salam Cemetery, almost on its perimeter at the east, directly on the main street that curtails the cemetery at the north-eastern side. Access to this shrine is very easy, as it is close to two main entrances at the north and south sides of the shrine, as shown in Figure 1. The shrine consists of a simple roof...
made of iron plate, and it is visited by many people from inside and outside Iraq. It is also one of the influences within the subject of the current study [13].

![Figure 1. Wadi Al-Salam cemetery. Source: Arc Map 10.2.](image)

5.6 Study area testing:
The selected monuments and their achievement of the indicators drawn from the theoretical framework in Table 1 were evaluated using the following weights (0, 1, 2, and 3), where 0 represents a failure to achieve the index, with achievement graded from 1 to 3. Table 2 shows the Kinetic coherence studies, and Table 3 the Visual coherence studies, based on Table 1, the theoretical framework, while the weights for each component and vocabulary item are explained in Table 4.

| Possible variables and values | Urban landmarks in the sequence mentioned in the research |
|------------------------------|----------------------------------------------------------|
| Ease of access to the monument | Connecting the monument to public transportation systems and expanding them | 0 | 0 | 2 | 2 | 3 | 1 | 1 |
| Flexibility and connection with the main road network | 1 | 1 | 2 | 2 | 3 | 2 | 2 |
| Providing parking for each monument | 0 | 2 | 1 | 1 | 2 | 3 | 1 |
| Lighting poles with streetlights | 1 | 1 | 2 | 2 | 3 | 3 | 1 |
The presence of clear axes leading to the monument | 0 1 2 2 3 2 1
---|---
Defining and determining paths with shading elements such as trees and roofs | 1 2 1 1 2 3 0

| Percentage | 16% 38% 55% 55% 88% 72% 33% |
|---|---|
| Directivity | Expanding the spaces surrounding the monuments to improve perception (clarity of the monument's visual range, such as adding urban spaces and urban nodes as a stage for ritual display) | 0 2 1 1 3 3 0 |
| | Directing the street or arranging buildings or elements in a specific order and creating an interconnected chain of blocks | 1 1 1 1 2 3 1 |
| | Organising the movement axes within the cemetery fabric according to the monument | 1 1 1 1 2 3 1 |
| | Achieving a space gradient within the context to form distinct points within space | 2 2 1 1 3 3 1 |
| | Emphasising the dominance of the monument by distinguishing its position | 1 2 2 1 3 2 1 |

| Percentage | 33% 53% 40% 40% 86% 93% 26% |
|---|---|
| The role of a monument in increasing the clarity of the fabric | Laying out the monuments within the most connected and permeable axes and spaces to contribute to understanding and knowing the structure of the fabric | 2 0 1 1 2 3 1 |
| | Directing visitors' movement in the fabric and allowing them to get to know it | 3 3 2 2 2 3 1 |

| Percentage | 83% 50% 50% 66% 100% 33% |
Table 3. Visual coherence studies

| Possible variable or values                                                                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|
| Creating an interconnected series of monuments, by interconnecting them in a series, and their continuity through the access and containment hierarchy. | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pulling all the axes towards the monument achieves dominance within the horizon line       | 1 | 1 | 2 | 2 | 2 | 1 | 1 |
| Monuments can be easily seen from far and near based on the dominance of the monument or its contrast with the context | 1 | 1 | 2 | 2 | 3 | 3 | 0 |
| Configuring the urban landscape with axis paths, monuments, content and street width      | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| Enhancing mental diagrams supporting visitor movement within the fabric and directing their movement through the optical treatments of the space organisation | 1 | 1 | 2 | 2 | 3 | 2 | 1 |

Percentage 26% 26% 53% 53% 73% 60% 26%

Table 4 weights and vocabulary item for each component.

| Note: The weight assigned to the impact of each variable was 1=weak impact, 2=medium impact, 3=good impact |
|----------------------------------------------------------------------------------------------------------|
| A statistical equation was used to standardise the values of the indicators (Percentage relative frequency) |
| \( x_i = \frac{x_i}{\sum x_i} \times 100\% \)                                                             |
| \( \chi_i = \frac{\text{Part}}{\sum\chi_i} = \text{Total} \)                                               |

6. Results and Discussion

The results shown in the tables were analysed for various types of interconnection. With regard to variable of accessibility of urban monuments within the movement links of the monument, as shown in Figure 2, the fifth monument, the shrine of Sayyid Muhammad Baqir al-Sadr (Holy his honourable secret) is the most important feature in terms of achieving accessibility to urban monuments, due to the location of the shrine being close to the main public transport line linking the northern neighbourhoods (Karbala Street), as well as the shrine being mostly surrounded by main streets. It also achieves the concept of dominance within the horizon line and meets the requirements of contemporary design. This is followed by the sixth monument, which is farther away than the fifth in relation to public transport lines, but which is nevertheless located on a main distributor street inside the cemetery. The fourth and third monuments are next, being located on the public transport line to the old city only. The second and seventh monuments achieve only part of the concept of accessibility, being better only than the first monument, the mosque of Imam al-Mahdi (may God be pleased with him), which is located in the old part of the cemetery, far away from public transport lines and the main streets.
Figure 2. Percentage of monuments’ achievement of ease of access

Figure 3. Percentage of monuments’ achievement of directionality

In terms of directional variables within the concept of movement linking of the monuments, as can be seen in Figure 3, the sixth monument, the shrine of Sayyid Muhammad Sadiq al-Sadr, is the religious monument that best achieves directionality, being located approximately in the middle of the cemetery, with a dominant dome, and being surrounding by space for religious rituals; this is again followed by the fifth monument, whose dome is dominant not only at the level of the Wadi al-Salam Cemetery, but also at the level of the city as a whole. The second monument (the shrine of the Prophets Hud and Saleh) can be seen upon entering the Wadi Al-Salam Cemetery from the entrance near the old city due to its dome, and special rituals for visits occur in its outer space. The third and fourth monuments, are located directly on the main street surrounding the old city, ad achieve little spatial gradient within their aspects, while first monument is surrounded by ancient tombs, and the seventh monument is not well defined.
With regard to a monument’s role in increasing the clarity of the fabric within the kinetic link of the monument, as shown in Figure 4, it is clear that the sixth monument is the most important; this monument is located within the movement axis, with the main distributing street being directly connected to one of the main gates of the cemetery, and thus directing the movement of visitors towards the monument. This is followed by the first monument, which is connected to one of the main streets of the cemetery via a secondary street, again representing the main movement axis for visitors going to the shrine. This in turn is followed by the fifth monument, and then the second, third, fourth and finally the seventh monument.

In terms of the visual connection of the monuments, as shown in Figure 5, the fifth monument is the most effective in achieving this, as it can be seen from all distances in the cemetery thanks to its
dominant dome. This is followed by the sixth monument, then the fourth and third monuments. The other monuments all took the same value.

7. Conclusions and Recommendations

Religious monuments, shrines and tombs, are among the features with major influential roles in structuring movement systems by directing axes. The concept of interconnectedness between religious monuments can be examined at two levels. The first is the Physical, achieved by organising the systems of masses, spaces and axes of motion, while the second is Moral, referring to spiritual and ideological connections.

The mobility interconnection is encouraged by ensuring easy access. It thus comes from the interconnectedness of the monuments with the public transportation systems, the provision of sufficient car parks, and the identification and determination of roads through street furniture, such as lighting, shading roofs, and afforestation. The concept of directionality also plays a prominent role in structuring the fabric, expanding the spaces surrounding monuments and adding urban spaces to act as theatres for rituals that increase perception of the monument. Directing the street or the elements in a specific format and organising the movement axes within the cemetery fabric according to the monuments’ locations, with an emphasis on the dominance of the monuments, would thus increase the directionality in the fabric as a whole. Monuments are major components of fabric formation, as the motion system is affected by the location of these monuments, and they act as reference points in the fabric, making journeys easier by directing the movement of people and allowing them to get to know the area. The siting of religious monuments in places penetrated by dynamic or optical axes thus maximises their role as guide points in the fabric of an area.

However, the optical interconnection is achieved by creating a coherent and homogeneous series of monuments while providing flexible containment and access. A monument that achieves domination, whether with huge building blocks or prominent domes across the skyline, pulls all visual axes towards it, and thus facilitates the sight of the monument from near and far, enhancing the formation of mental plans among visitors based on formal hegemony and the optical treatment of space organisation. Sensory interconnectedness contributes to the creation of a mental picture of the fabric structure, allowing communication and reminding visitors of events; the history of the monuments and the memory of the events together play a prominent role in enhancing collective memory. Increases in the number of visitors and tourists and the easy identification of monuments increases moral coherence between monuments and allows the enhancement of identity through a sense of belonging, and the strengthening of relationships and social ties. The borrowing of symbols from these monuments for the surrounding urban context enhances the distinctive personality of the area’s fabric and reflects the life of the community. The siting of religious monuments in places that are crossed by dynamic or optical axes thus also maximises their role as a signifier for the fabric of an area.

The most noticeable thing about the Wadi al-Salam cemetery is the lack of connectivity between the prominent religious monuments in the cemetery’s fabric, and the lack of spaces surrounding them for the rituals of such visits. Many religious monuments in the Wadi Al-Salam Cemetery are also far from the public transportation systems and without their own parking spaces or shading elements such as trees and roofs. Some religious monuments are also difficult to distinguish or see, due to the similarity of the monument to the general fabric.

Based on these findings, it is important to reconnect these monuments by developing an organic movement network that works to preserve the graveyard and the historical fabric of the cemetery. It would also be useful to site cultural activities between these monuments, such as open-air museums that recount the narratives and histories of the relevant religious figures, in order to enhance the collective memory of the community and its visitors. Such organic paths should provide ease of access as well as offering opportunities for visitors and pilgrims to visit the graves of their relatives and the shrines of interest via paved and convenient paths that integrate with the current transportation systems. Based on this, a proposal to reconnect the movement system in the Wadi al-Salam cemetery according to the selected monuments, as shown in the proposed scheme in Figure 6, was developed. This figure shows
the scheme of the actual (right) and suggested (left) axes of the movement connection between the religious monuments.

![Proposed](image1.png) ![Current](image2.png)

**Figure 6:** Scheme of actual (right) and suggested (left) axes of movement connection between the religious monuments

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