Doctoral School of History

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PhD Dissertation Booklet

Analytical Study of the Archaeological Buildings in Al-Mīdān neighborhood in Damascus using 3D Photography Technologies

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ABSTRACT

Al-Mīdān represents one of the most important historical districts of Damascus and constitutes the largest urban expansion developed beyond the southern walls of the Old City. Despite its historical, architectural, and cultural significance, the district has received limited scholarly attention and remains exposed to increasing urban pressures and heritage deterioration.

This dissertation investigates the archaeological and historical buildings of Al-Mīdān through an integrated methodology combining archaeological research, architectural documentation, GIS applications, photogrammetry, and three-dimensional recording technologies. The study aims to establish a comprehensive documentation framework capable of supporting heritage management, conservation planning, and adaptive reuse initiatives.

The research documents and analyses a wide range of heritage assets, including mosques, baths, churches, cemeteries, traditional markets, and Al-Bawāyik. Particular attention is given to Al-Bawāyik as one of the most distinctive architectural typologies of the district.

The results demonstrate the effectiveness of integrating traditional and digital documentation methods in producing accurate heritage records and supporting conservation decision-making. The proposed framework was applied to Al-Sharbajī Bāyka as a case study, resulting in a condition assessment, rehabilitation strategy, and adaptive reuse proposal.

RESEARCH BACKGROUND

Why Al-Mīdān?

- Largest historical expansion beyond the southern walls of Damascus.
- Closely connected to the Hajj route and regional trade networks.
- Rich concentration of archaeological and historical buildings.
- Increasingly threatened by urban transformation and deterioration.
- Limited previous documentation and conservation studies.

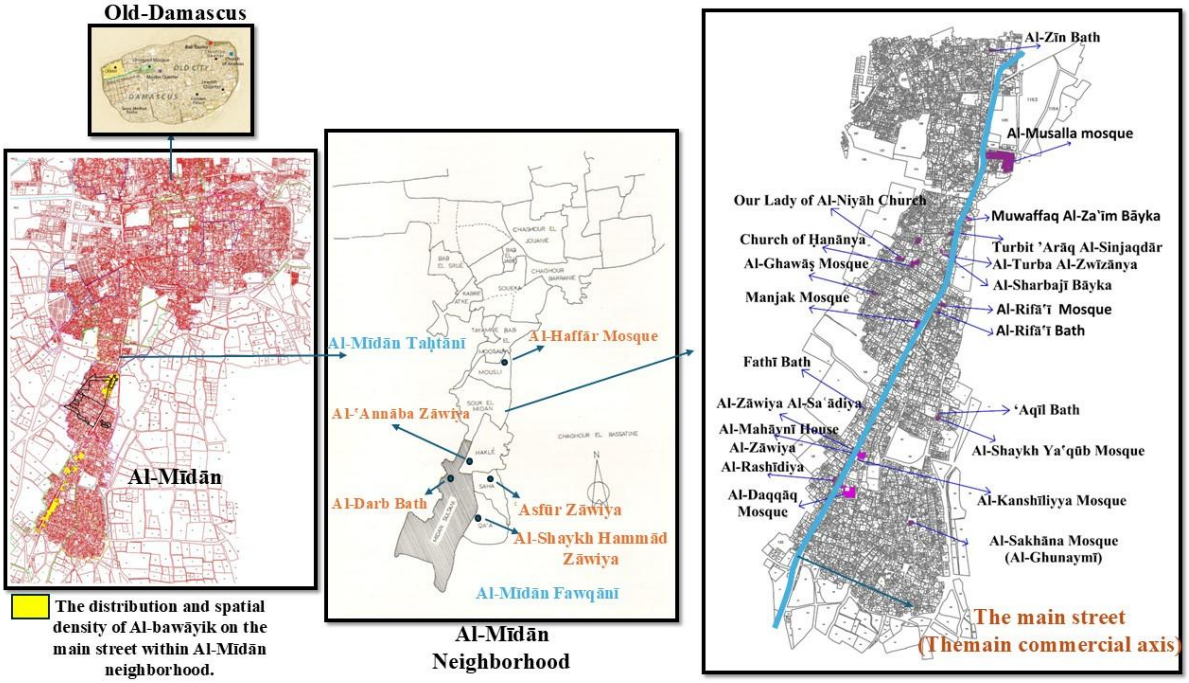


Spatial distribution of Al-Bawāyik and principal urban features within Al-Mīdān.

STUDY AREA AND HERITAGE SIGNIFICANCE

Al-Mīdān developed as a major commercial, social, and religious center outside the walls of Damascus. Its strategic position along pilgrimage and trade routes contributed to the formation of a distinctive urban and architectural character that continues to reflect important aspects of Damascus's historical identity.

- Heritage Significance.
- Commercial significance.
- Religious significance.
- Urban significance.
- Architectural significance.
- Cultural significance.



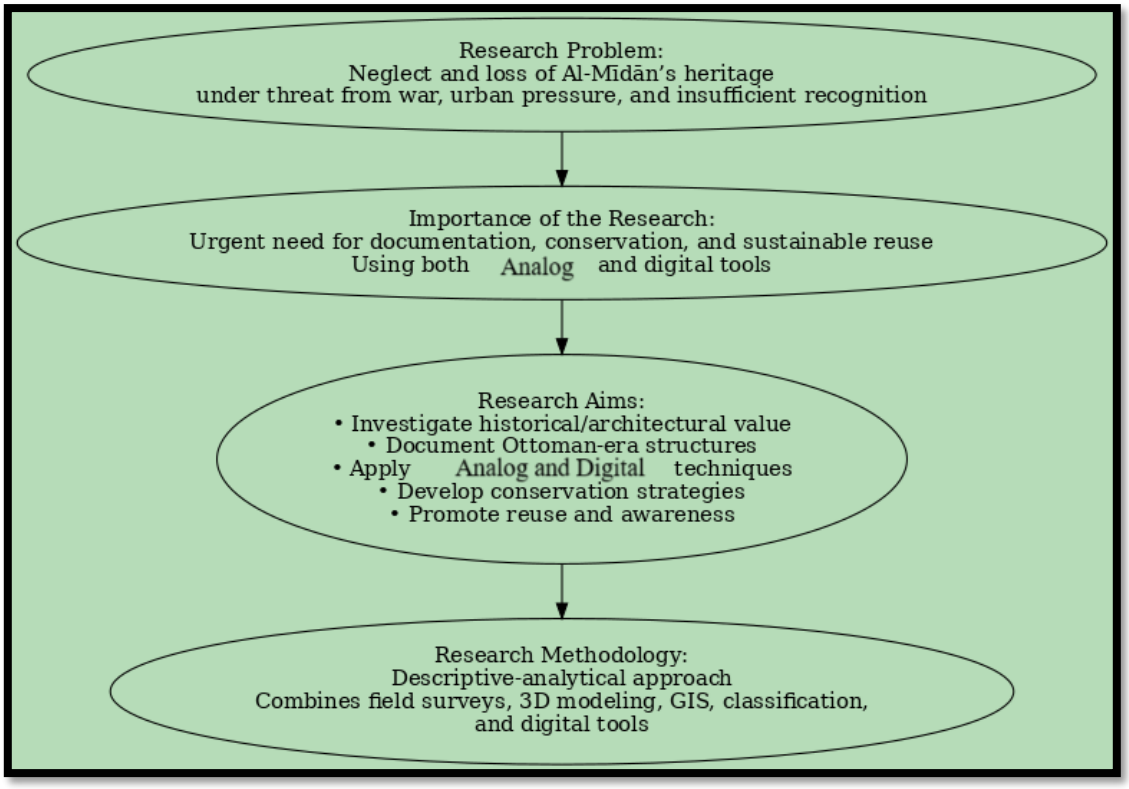
Distribution of heritage resources and principal archaeological landmarks in Al-Mīdān

RESEARCH METHODOLOGY

The research adopts an interdisciplinary methodology integrating archaeological investigation, field survey, architectural documentation, GIS analysis, photogrammetry, and three-dimensional recording technologies. These approaches collectively support the documentation, assessment, and conservation of heritage buildings.

Research Workflow:

1- Historical Research.
2- Field Survey.
3- Architectural Documentation.
4- GIS Analysis.
5- 3D Documentation.
6- Condition Assessment.
7- Conservation Proposal.



Integrated methodological framework adopted in the research

HERITAGE INVENTORY OF AL-MĪDĀN

A comprehensive inventory was prepared to document and classify the principal heritage resources of Al-Mīdān. The survey identified a diverse range of archaeological buildings reflecting the historical development of the district.

Heritage Categories:

- Churches.
- Mosques.
- Baths.
- Cemeteries.
- Markets.
- Al-Bawāyik.
- Other historic buildings.

TYPOLOGICAL CLASSIFICATION OF AL-BAWĀYIK:

The research proposes a typological classification of Al-Bawāyik based on architectural characteristics, functional use, roof morphology, spatial organization, historical significance, and physical condition. This classification contributes to understanding the role of Al-Bawāyik in the development of Al-Mīdān and provides a basis for future conservation efforts.

Table illustrating the classification method and its underlying criteria

Historical Value			Artistic Value				Façade Elements								Roof Typology			Distinctive Features			Function		Physical Condition			Final Score
Late Ottoman	French Mandate	Modern/ contemporary	high	Moderate	low	Lacking Value	Arch Form		Typology of Doors		Window Openings				Flat	Flat Roof Supporting an Upper Floor	Gabled Roof	Decorative Window	Wrought Iron	Architectural Additions	Still functions as a grain warehouse, closed	New Function	Good	Moderate	Bad	Value
							Two or more	Single Arch	No Arch	Wooden	Iron Shutter	More than one window	Old Window	Modern/ Contemporary				Old and Decorated	Contains operational (electrical) components	Annex						
3	2	1	3	2	1	0	3	2	1	3	2	3	2	1	1	2	3	3	3	3	1	0	3	2	1	
		1				0			1					1	1					3		0			1	8
	2			2			2						2			2				3	1			2		16
3			3				3			3		3					3	3	3	3			3			30

Assessment Methodology

The evaluation of the bayka's historical significance is based on a graded scale, where the final score determines the level of heritage value and the necessity for preservation. The interpretive criteria are as follows:

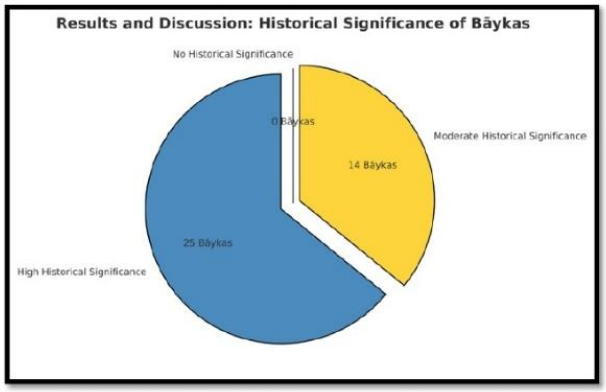
- A score between 0 and 8 indicates that a Bāyka holds no historical value and is not considered significant from a heritage conservation perspective.
- A score between 9 and 16 reflects a Bāyka of moderate historical value, meriting documentation but not necessarily preservation intervention.
- A score between 17 and 30 signifies a Bāyka of high historical significance, warranting prioritized attention, conservation efforts, and potential integration into heritage protection frameworks.

Results and Discussion

1- High Historical and Artistic Significance:
Of the total sample comprising 39 Bāykas, a total of 25 Bāykas were identified as possessing a high degree of historical and artistic value. These structures demonstrate notable architectural characteristics and cultural relevance, thereby justifying their prioritization for conservation efforts and in-depth scholarly analysis.

2- Moderate Historical Significance:
Out of the total sample of 39 Bāykas analyzed in this study, 14 Bāykas were found to exhibit a moderate level of historical significance. While these do not reach the threshold of critical heritage status, they nonetheless retain considerable historical merit and should be considered for future documentation, evaluation, and possible integration into broader preservation strategies.

3- Absence of Negligible Value:
None of the structures assessed were classified as lacking historical value. This outcome underscores the overall cultural and architectural richness of the sample and reaffirms the necessity of continued heritage-focused research within the urban fabric of the Al-Mīdān district.



✓ Accordingly, it can be concluded that all of the Bāykas possess at least a minimum degree of historical value, which necessitates their preservation. These structures should be maintained not only as tangible witnesses to the architectural character of the late Ottoman period but also as enduring evidence of the economic activity associated with the pilgrimage route. Figure (1,57).

A comprehensive architectural assessment of Al-Bawāyik structures in the Al-Mīdān neighborhood

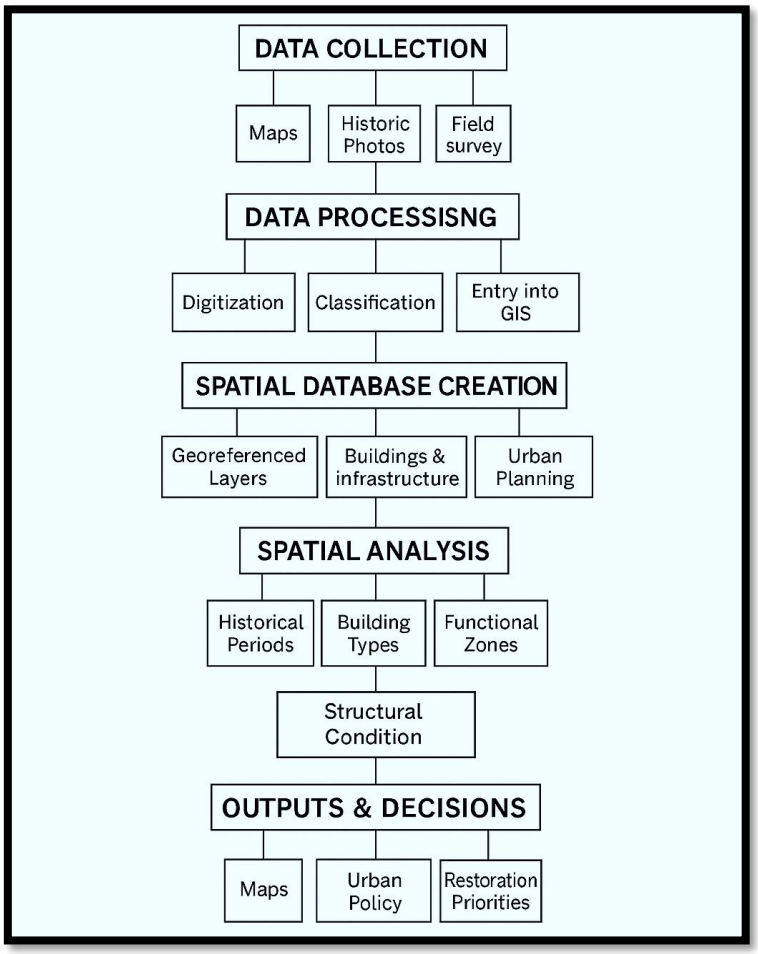
GIS-BASED DOCUMENTATION AND ANALYSIS

A GIS database was established to integrate architectural, historical, spatial, and condition-related information concerning the heritage resources of Al-Mīdān. The database supports heritage management and conservation planning.

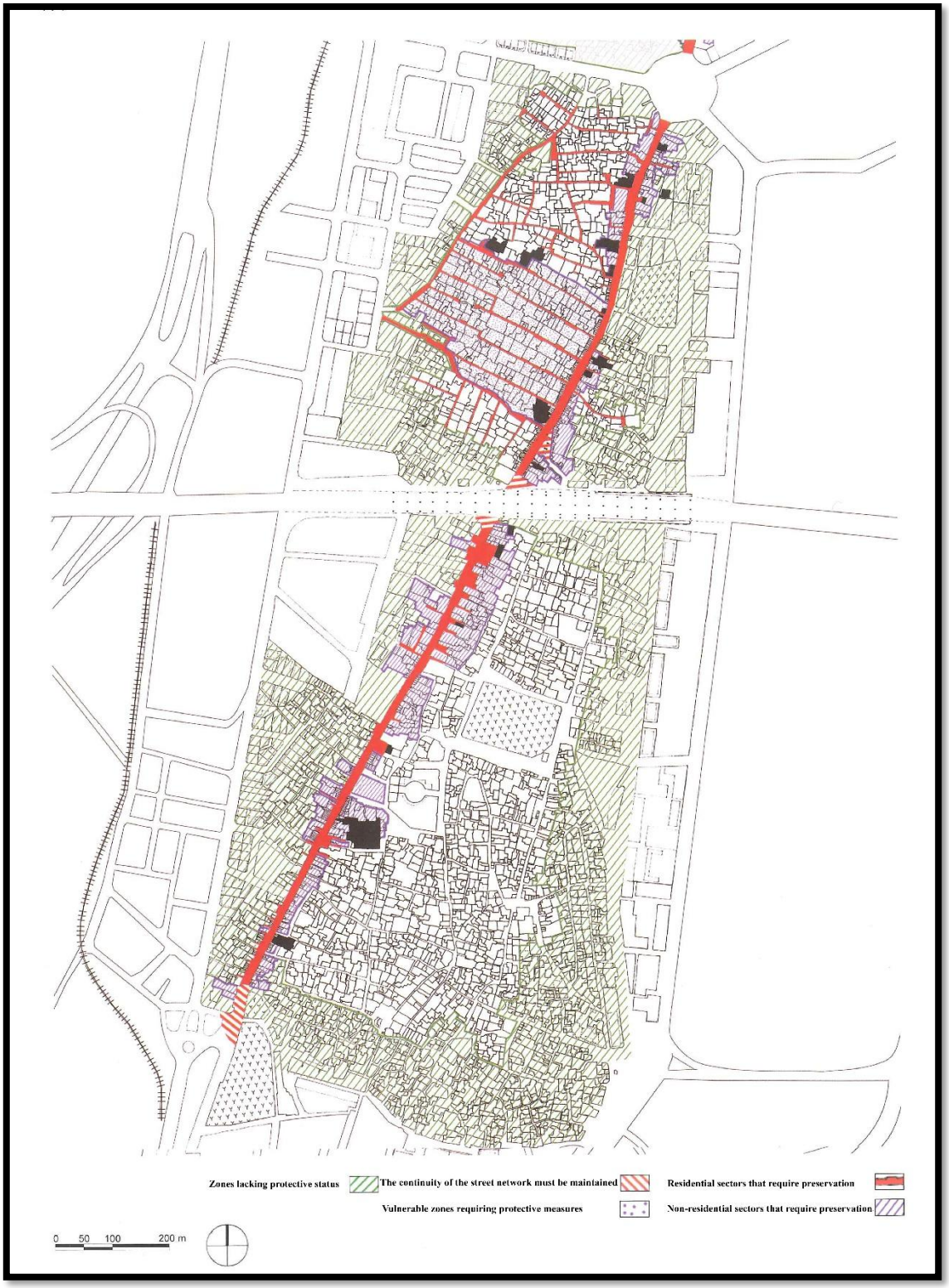
GIS enabled the integration of spatial, historical, architectural, and condition-related data within a unified heritage management database.

GIS Outcomes:

- Heritage Mapping.
- Land-Use Analysis.
- Building Condition Assessment.
- Urban Transformation Analysis.
- Conservation Priority Identification.



Workflow of GIS application in Al-Mīdān Neighborhood.



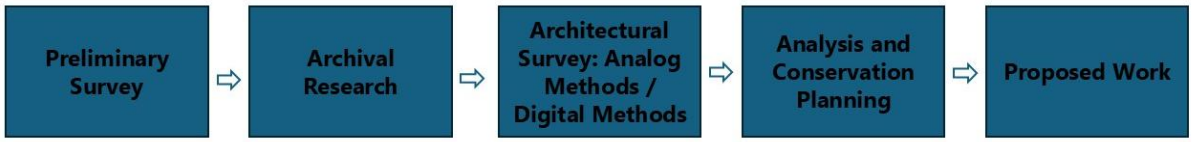
A GIS-generated map integrating key data on Al-Mīdān's sectors, including historically significant areas, to support informed, sustainable development while preserving the district's cultural and urban integrity.

INTEGRATED DOCUMENTATION FRAMEWORK

One of the principal achievements of the research is the integration of traditional archaeological documentation methods with modern digital technologies, producing a comprehensive framework for heritage recording and management.

Components:

- Archaeological Survey.
- Architectural Documentation.
- GIS Applications.
- Photogrammetry.
- 3D Documentation.
- Heritage Assessment.



Documentation and Analysis Workflow

CASE STUDY: AL-SHARBAJĪ BĀYKA

Al-Sharbajī Bāyka was selected as the principal case study due to its historical significance and representativeness of the traditional Al-Bawāyik typology. The building was documented using architectural survey, photogrammetry, and three-dimensional recording techniques.

Main Outputs:

- Architectural Drawings.
- 3D Model.
- Condition Assessment.
- Conservation Proposal.





3D-Modeling view showing Al-Sharbajī Bāyka integrated into its historical neighborhood context

DETERIORATION ASSESSMENT

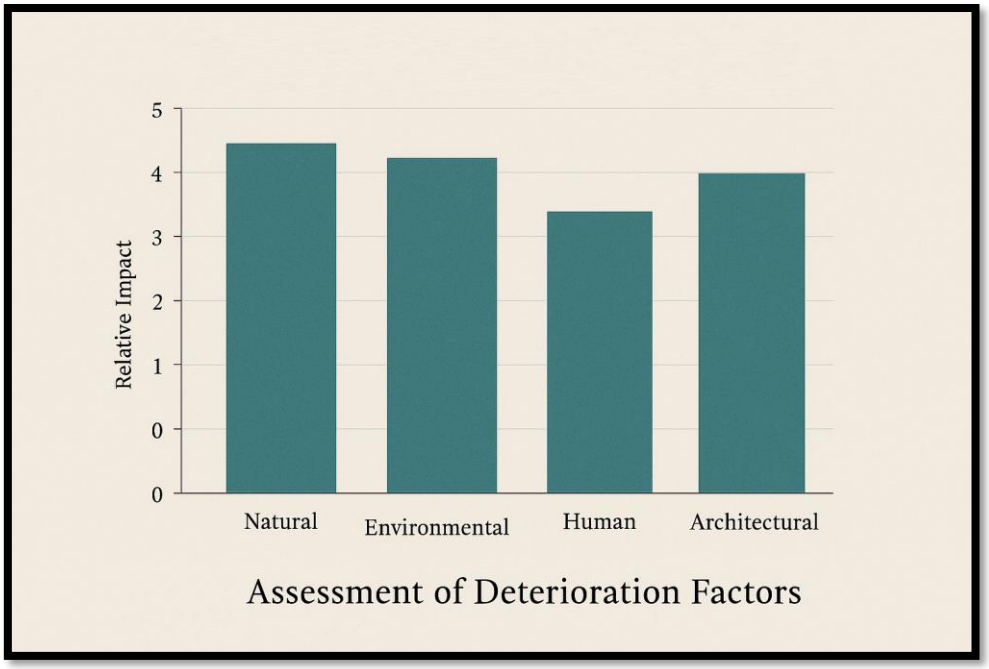
The study identified several deterioration factors affecting the archaeological buildings of Al-Mīdān.

Major Factors

- Moisture.
- Weathering.
- Inappropriate Interventions.
- Urban Pressures.
- Environmental Factors.
- Traffic Impacts.

Factor	Description	Relative Impact (1–5)
Natural	Rain, humidity, rising moisture, and water infiltration causing decay and erosion.	**4.5 (Very High)**
Environmental	Pollution, overcrowding, traffic-induced vibrations, garbage accumulation.	**4.2 (Very High)**
Architectural	Incompatible contemporary construction materials, excessive height, visual pollution.	**4.0 (High)**
Human	Wars, neglect, real estate pressure, misuse, loss of traditional ownership.	**3.5 (Moderate-High)**

Assessment of Deterioration Factors in Al-Mīdān Neighborhood.



Assessment of the relative impact of deterioration factors affecting architectural heritage in Al-Mīdān.

The chart is based on field observations and qualitative evaluations, indicating that natural and environmental factors exhibit the highest impact, followed by architectural and human-induced causes.

Deterioration Factor	Impact Level (1–5)	Color Code
Subterranean Water Infiltration	4.5	Red
Drainage Deficiencies	3.5	Yellow
Humidity & Insulation	4.5	Red
Rainwater & Thermal Fluctuations	4.5	Red
Excessive height	4	Orange
Biological Decay	4.5	Red
Non-traditional construction materials	4	Orange
Avian Activity	4.5	Red
Human Activity	3.5	Yellow

- 5 = Very High Impact (Red)
- 4 -5= High Impact (Orange)
- 3 -4= Moderate Impact (Yellow)

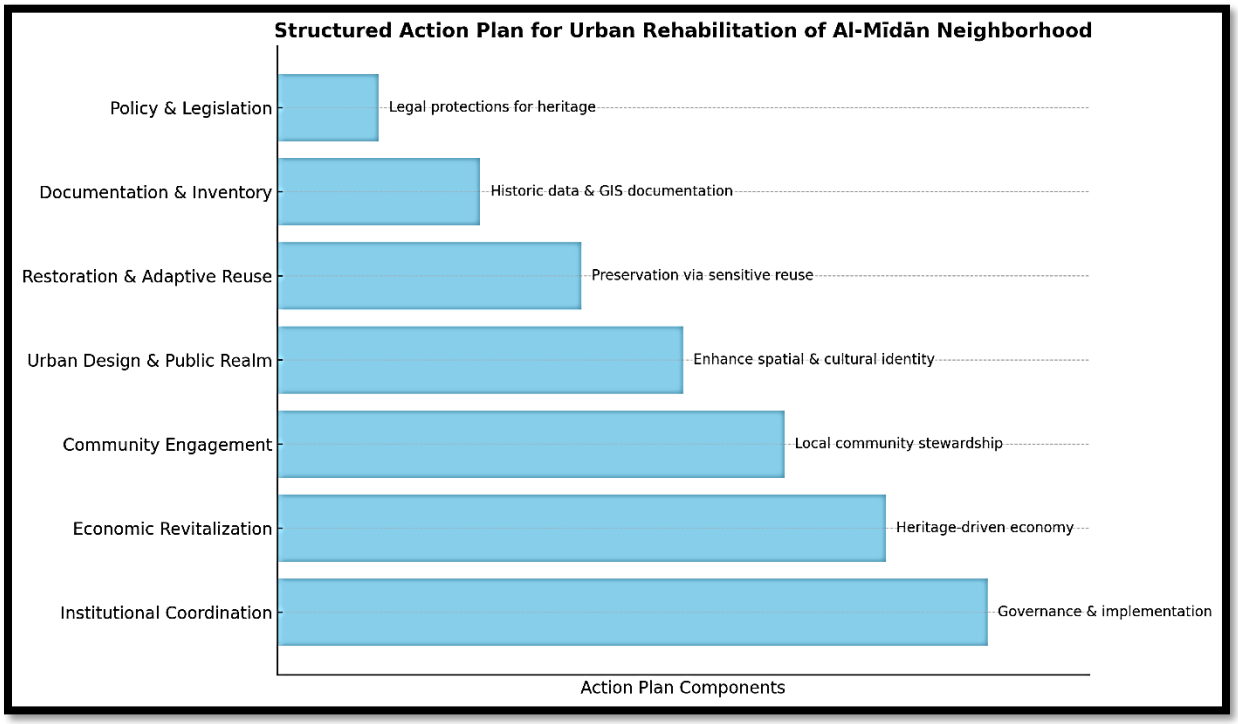
Classification of deterioration factors affecting the architectural heritage of Al-Mīdān, based on field observations and material assessments. Each factor is evaluated according to its relative impact level on a 1–5 scale, with corresponding color codes indicating severity: red for very high impact, orange for high impact, and yellow for moderate impact.

REHABILITATION AND ADAPTIVE REUSE STRATEGY

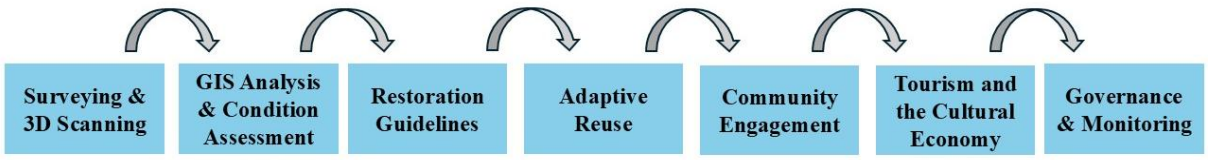
The proposed conservation strategy links documentation, assessment, conservation, and adaptive reuse within a unified framework aimed at ensuring the long-term preservation of heritage resources.

Strategy:

- Documentation.
- Assessment.
- Conservation.
- Rehabilitation.
- Adaptive Reuse.



Structured Action Plan for the Urban Rehabilitation of Al-Mīdān Neighborhood.



From Documentation to Sustainable Rehabilitation in Al-Mīdān

PRINCIPAL FINDINGS

Historical Findings:

- Al-Mīdān is the largest southern expansion of Damascus.
- Its growth was influenced by pilgrimage and trade.
- The district possesses a distinct urban identity.

Architectural Findings:

- High diversity of heritage buildings.
- Al-Bawāyik represent a unique building type.
- Significant architectural and historical values remain preserved.

Documentation Findings:

- GIS significantly improved heritage analysis.
- 3D documentation enhanced recording accuracy.

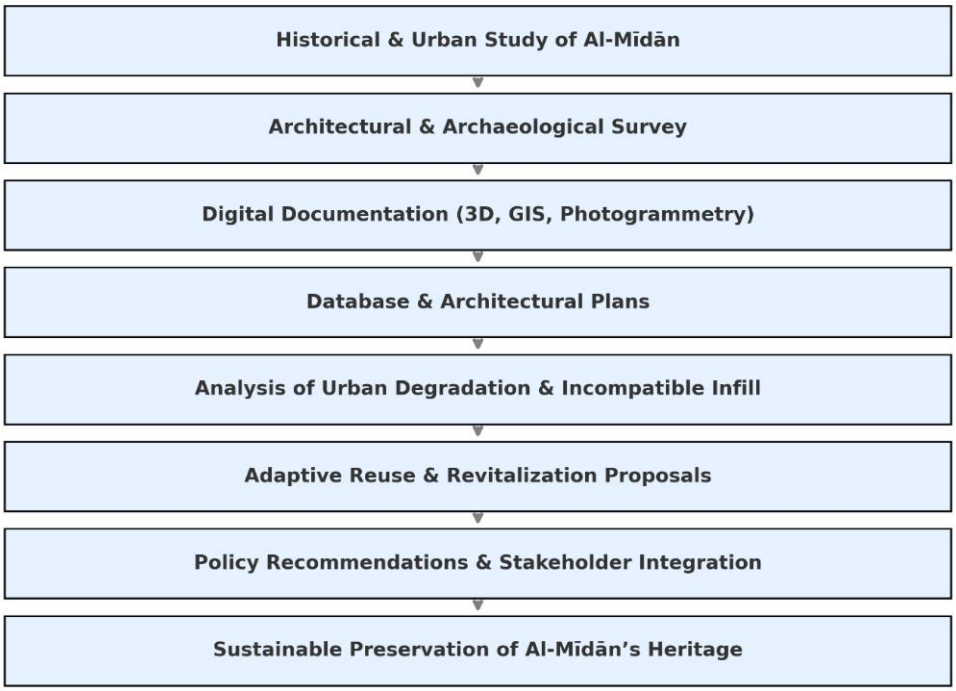
Conservation Findings:

- Natural and environmental deterioration factors are dominant.
- Conservation requires integration with adaptive reuse.

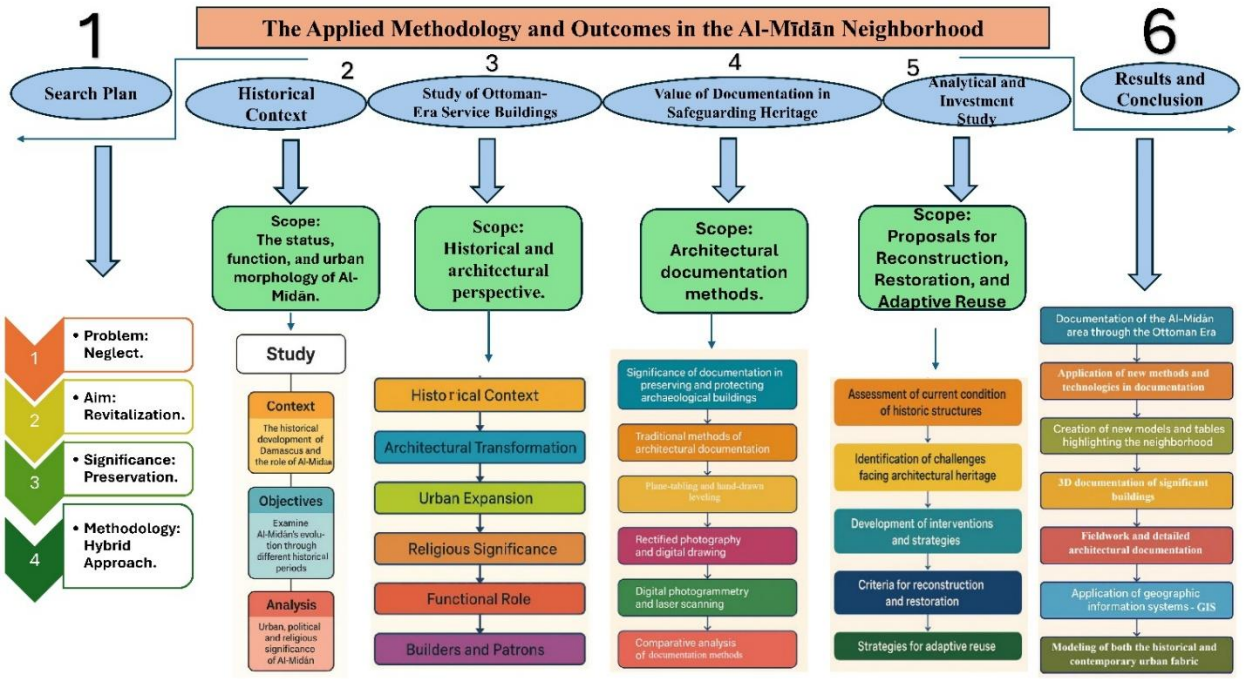
ORIGINAL SCIENTIFIC CONTRIBUTIONS

- Comprehensive Inventory of Heritage Buildings.
- GIS-Based Heritage Database.
- Typological Classification of Al-Bawāyik.
- Integrated Documentation Methodology.
- Conservation and Adaptive Reuse Framework.

The primary contribution of the dissertation is the integration of archaeological, architectural, spatial, and digital documentation approaches within a unified conservation framework.



Integrated Research Framework for the Conservation of Al-Mīdān neighborhood



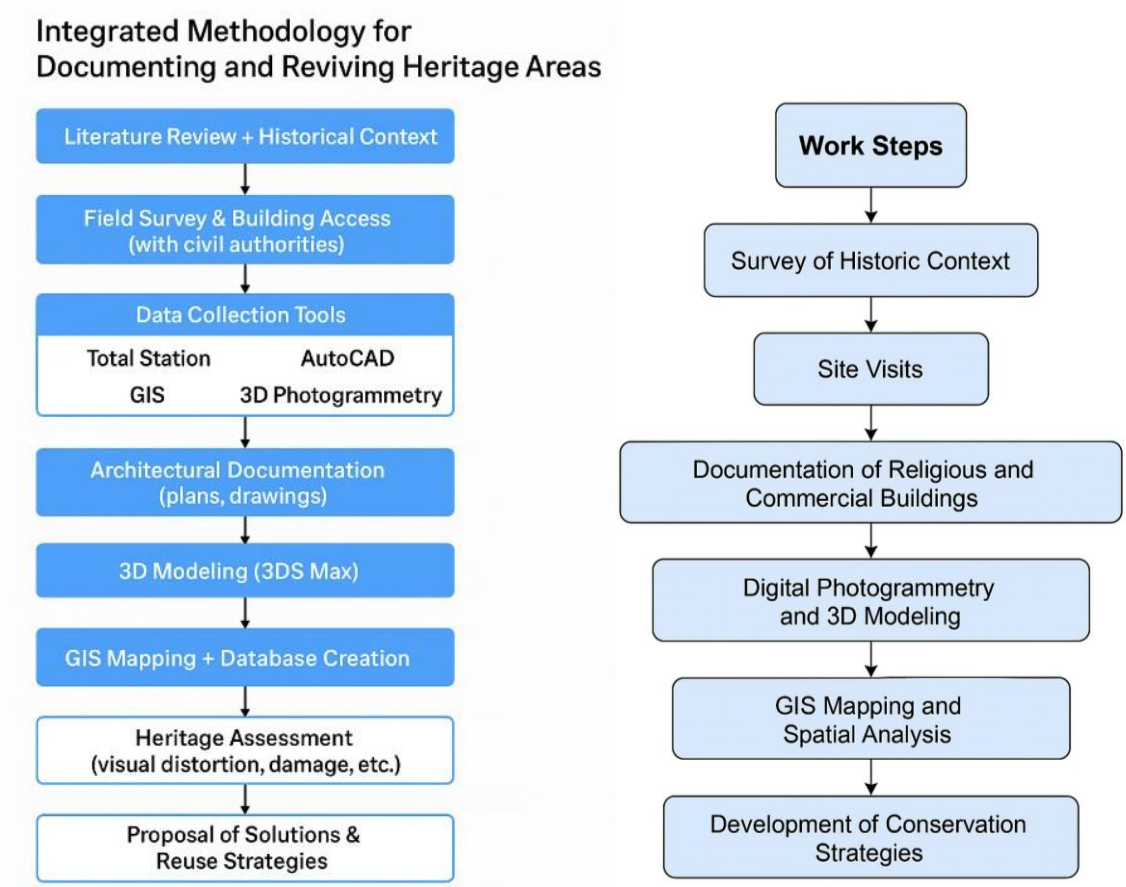
The applied methodology and outcomes in Al-Mīdān neighborhood.

TRANSFERABLE HERITAGE DOCUMENTATION FRAMEWORK

The proposed framework extends beyond Al-Mīdān and can be applied to other historical urban environments facing similar conservation challenges.

Framework Stages:

- Identification.
- Documentation.
- Assessment.
- Conservation Planning.
- Adaptive Reuse.



The flowchart outlines a scalable framework applicable to future research.

PUBLICATIONS AND CONCLUSION

This dissertation demonstrates the value of integrating archaeological investigation, architectural documentation, GIS applications, photogrammetry, and three-dimensional recording technologies in heritage conservation. The proposed framework provides a practical model for documenting, assessing, conserving, and adaptively reusing historical buildings within Al-Mīdān and comparable historic urban areas.

Publications:

- Studying the movement of archaeological installations using a laser scanner and digital cameras.
- Syria from a three-dimensional point of view. A project to preserve the antiquities of Syria and protect them from extinction using 3D technology.
- Analytical Study for Minimizing the Discrepancy Between Direct and Indirect Leveling Measurements Across a Convex Road Surface.
- Archaeological Photography Techniques.