

Accessibility Assessment of a Historic Mosque Through Universal Design Principles: The Case of Edirne Old Mosque

Research Article
10.65520/erciyesfen.1914527

Imprint:

Volume: 42(3)

Year: 2026

Page: 201-219

 Berk MİNEZ^a
 Aşlı ZENCİRKIRAN^{b*}

^a Asst. Prof., Trakya University,
berkminez@trakya.edu.tr

^b Asst. Prof., Trakya University,
aslimeral@trakya.edu.tr

* Corresponding Author

Received: 3/23/2026

Accepted: 7/25/2026

Citation:

Berk MİNEZ, Aşlı ZENCİRKIRAN
(2026). Accessibility Assessment of a
Historic Mosque Through Universal
Design Principles: The Case of Edirne
Old Mosque. *Erciyes University Journal
of Institute Of Science and Technology*,
42(3), 201-219.
[https://doi.org/10.65520/erciyesfen.
1914527](https://doi.org/10.65520/erciyesfen.1914527)

Screened by

 iThenticate®
for Authors & Researchers



Except where otherwise noted, content
in this article is licensed under a
Creative Commons 4.0 International
license. Icons by Font Awesome.

Abstract

Background/Aim: This study examines the accessibility of the Edirne Old Mosque within the context of Universal Design Principles and assesses its relationship with contemporary access standards for historical buildings.

Methods: The study utilized observation, measurement, and standard comparison methods, analyzing physical, perceptual, and environmental accessibility in accordance with TSE 9111, TSE 12576, ADAAG, and ICOMOS principles.

Results: Findings revealed an overall accessibility level of 46%. The lack of ramps and signage in the exterior, inadequate floor texture and lighting in the interior, and lack of Braille and multilingual signage in the information system were identified. However, the wide-open spaces and central location of the spatial organization present opportunities for improvement. The study developed recommendations for portable ramps, tactile surfaces, contrast enhancement, and administrative awareness, based on the principle of "reversible intervention." The results demonstrate that accessibility is not only an architectural necessity but also a strategic element in social policy and the democratization of cultural heritage.

Conclusion: This study contributes original value by demonstrating how universal design principles can be systematically applied to a historic mosque, offering an evidence-based framework for balancing accessibility requirements with heritage conservation.

Keywords: Accessibility, Universal Design, Historical Buildings, Mosques, Cultural Heritage



Evrensel Tasarım İlkeleriyle Tarihi Bir Caminin Erişilebilirlik Değerlendirmesi: Edirne Eski Cami Örneği

Öz

Amaç: Bu çalışma, Evrensel Tasarım İlkeleri bağlamında Edirne Eski Camii'nin erişilebilirliğini incelemekte ve tarihi binalar için çağdaş erişim standartlarıyla ilişkisini değerlendirmektedir. **Metodoloji:** Çalışma, TSE 9111, TSE 12576, ADAAG ve ICOMOS ilkelerine uygun olarak fiziksel, algısal ve çevresel erişilebilirliği analiz etmek için gözlem, ölçüm ve standart karşılaştırma yöntemlerini kullanmıştır. **Bulgular:** Bulgular, genel erişilebilirlik düzeyinin %46 olduğunu ortaya koymuştur. Dış cephede rampa ve yönlendirme levhalarının eksikliği, iç mekanda yetersiz zemin dokusu ve aydınlatma ile bilgi sisteminde Braille ve çok dilli yönlendirme levhalarının eksikliği tespit edilmiştir. Bununla birlikte, geniş açık alanlar ve mekansal organizasyonun merkezi konumu iyileştirme potansiyeli sunmaktadır. Çalışma, "geri dönüşümlü müdahale" ilkesine dayanarak taşınabilir rampalar, dokunsal yüzeyler, kontrast iyileştirme ve idari farkındalık için öneriler geliştirmiştir.

Sonuçlar, erişilebilirliğin sadece mimari bir gereklilik değil, aynı zamanda sosyal politikada ve kültürel mirasın demokratikleştirilmesinde stratejik bir unsur olduğunu göstermektedir. Özgünlük: Bu çalışma, evrensel tasarım ilkelerinin tarihi bir camiye nasıl sistematik olarak uygulanabileceğini göstererek özgün bir değer katmakta ve erişilebilirlik gereksinimlerini kültürel mirasın korunmasıyla dengelemek için kanıta dayalı bir çerçeve sunmaktadır.

Anahtar kelimeler: Erişilebilirlik, Evrensel Tasarım, Tarihi Yapılar, Camiler, Kültürel Miras



1. INTRODUCTION

Historic buildings serve as physical reminders of the past, shaping how societies remember aspects of the past and showing who they are as a cultural heritage. While preserving these structures is essential, ensuring public access to them is equally critical to cultural sustainability [1]. The accessibility of cultural heritage sites and buildings for individuals with disabilities encompasses not only physical access but also social participation and cultural rights [2].

In contemporary discourse, accessibility is widely recognized as an integral component of human rights. Article 9 of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) obliges member states to ensure accessibility in cultural environments. Therefore, accessibility transcends mere technical compliance and is a spatial embodiment of overarching concepts such as social equality, justice, and inclusivity [3].

The acknowledgment of accessibility as a design requirement and a fundamental aspect of societal sustainability was theoretically substantiated by the advent of Universal Design in the 1990s. In 1997, Ronald L. Mace and his coworkers developed the Universal Design Principles, which outline seven key ideas intended to ensure equal access for all user groups (Figure 1).

1. Equitable Use	2. Flexibility in Use	3. Simple and Intuitive Use	4. Perceptible Information	5. Tolerance for Error	6. Low Physical Effort	7. Size and Space for Approach and Use
- Provides equal options for all users - Avoids exclusion or stigmatization - Ensures equal safety and usability - Designs that work for everyone	- Offers alternative ways of use - Supports right- and left-handed operation - Provides adaptability and user control - Accommodates a wide range of individual preferences	- Minimizes unnecessary complexity - Aligns with user expectations and common conventions - Ensures consistency regardless of the user's experience, knowledge or language ability - Supports effective user guidance	- Communicates essential information clearly (visual, tactile, auditory etc.) - Enhances legibility through contrast and redundancy - Ensures critical features are distinguishable - Compatible with assistive devices	- Minimizes hazards and adverse consequences - Provides safety warnings - Incorporates fail-safe features - Prevents accidents caused by misuse	- Maintains comfortable body posture - Minimizes strength requirements - Reduces repetitive actions - Enables efficient and fatigue-free use	- Provides sufficient clear floor space - Ensures ease of approach for all users - Allows comfortable mobility and maneuvering - Compatible with assistive devices

Figure 1. Universal Design Principles Diagram, adapted from [4].

Applying universal design principles within historic buildings requires balancing accessibility with conservation ethics (Figure 2). This tension—often described as the “conservation–access paradox”—highlights the challenge of ensuring inclusive use while safeguarding architectural authenticity [5], [6]. Feilden (2004) describes this balance as the dual responsibility to both preserve and use cultural heritage as a collective value.

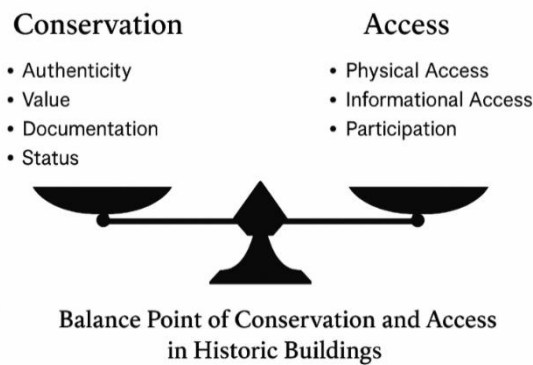


Figure 2. Conservation–Access Paradox Scheme, created by the author based on [5], [6], [7].

The connection between accessibility and conservation goes beyond the physical design of buildings. It also includes management techniques, organizational structure, and how users feel about them. When making changes to historic buildings, the goal should not just be to add ramps or elevators. Instead, the goal should be to make sure that all users may access and use the building in similar ways [8]. Standards such as TS 9111 (2011) [9] and TS 12576 (2012) [10] provide rules for accessibility in Türkiye. These rules mostly apply to new buildings and often clash with the original materials, textures, and spaces of historic buildings [11]. Moreover, while national laws like Law No. 5378 on Persons with Disabilities (2005) and the Accessibility Monitoring and Inspection Regulation (2020) require public buildings to be accessible, this is not happening much in the cultural heritage context [12].

In this context, evaluating the Edirne Old Mosque—one of the city’s most iconic structures—through the perspective of Universal Design constitutes a pivotal case for architectural and social policy study. This study aims to examine the physical, environmental, and perceptual accessibility of the Edirne Old Mosque in accordance with Universal Design Principles, identify current obstacles, and suggest viable remedies. The study relies on field measurements, direct observations, and photographic documentation, which are assessed against national and international accessibility requirements (Table 1). Even though more and more people around the world are paying attention to accessibility in heritage sites, there aren’t many studies that use Universal Design Principles to examine Ottoman mosques. This research addresses this deficiency.

Table 1. Chronological Development of Accessibility Policies and Standards

Year	Institution / Document	Document Title and Scope	Accessibility Approach / Key Principles
2006	United Nations (UN)	<i>Convention on the Rights of Persons with Disabilities (CRPD)</i>	Defines accessibility as a fundamental human right. Obligates member states to ensure accessibility in the physical environment, transportation, information and communication technologies.
2010	Americans with Disabilities Act Accessibility Guidelines (ADAAG)	<i>2010 ADA Standards for Accessible Design</i>	Details architectural accessibility criteria. Specifies standards for ramps, door widths, floor slopes, signage and elevator requirements.
2011	Turkish Standards Institution (TSE)	<i>TS 9111 – Accessibility Requirements for Buildings for People with Disabilities and Limited Mobility</i>	Defines accessibility criteria for public buildings, open spaces and public transport in Türkiye. Harmonized with international norms.
2013	ICOMOS	<i>The Burra Charter: The</i>	Recommends balancing accessibility

		<i>Australia ICOMOS Charter for Places of Cultural Significance</i>	with authenticity and integrity in heritage conservation. Emphasizes the “conservation–access balance.”
2015	British Standards Institution (BSI)	<i>BS 8300-2: Design of an Accessible and Inclusive Built Environment</i>	Establishes principles of inclusive design for all users. Standardizes universal design concepts and provides technical architectural criteria.

2. LITERATURE REVIEW

Accessibility in historic structures represents a multifaceted research domain at the confluence of architecture, social policy, and heritage protection. The literature primarily progresses along two principal dimensions: (1) delineating physical obstacles encountered by individuals with impairments in historic settings, and (2) reconciling universal design principles with conservation ethics [13], [7].

In Europe, organizations like Historic England [14] and the Cultural Council of Ireland (2011) support the idea of reversible intervention as a main way to make cultural buildings more accessible. This method contends that ramps, portable lifts, and tactile guide surfaces can improve accessibility without making permanent changes to historic materials [15]. Jeżyńska (2022) stresses that accessibility assessments in Poland should not only consider physical aspects but also navigational and perceptual issues [16]. In Spain, Marín-Nicolás and Sáez-Pérez (2022) devised a scoring-based approach to assess accessibility in cultural heritage buildings, demonstrating that accessibility performance varies by building typology [17]. Chidiac and Reda (2025) categorize access barriers in Egypt into physical, perceptual, and managerial aspects, emphasizing the impact of cultural context on accessibility practices [6]. The National Trust (UK, 2017) and Scottish Heritage Access Guidance publications both stress the importance of striking a balance between physical and experiential integrity when making historic buildings more accessible.

UNESCO's World Heritage and Sustainable Tourism Program (2011) and ICOMOS's Charter on Cultural Routes (2008) articulate that accessibility is a cultural participation right, not just a physical need. ICOMOS believes that everyone should be able to visit heritage sites as part of cultural sustainability. This is why they support accessibility rules grounded in ethics that take all aspects of accessibility into account. The European Commission's Access City Award program also encourages the sharing of best practices in historic urban areas by promoting excellent accessibility initiatives. This initiative underscores the importance of spatial inclusivity for diverse user groups, including persons with disabilities, older adults, and families with children. A comparative overview of these studies is presented in the table below (Table 2).

Table 2. Summary of Accessibility Studies in Historic Buildings

Year	Author(s)	Study / Source	Country / Scope	Method / Type of Analysis	Key Findings
2004	Feilden, B. M.	<i>Conservation of Historic Buildings</i>	Global	Theoretical analysis	Emphasizes the importance of balancing “authenticity” and “access,” noting that accessibility is both a physical intervention and an ethical responsibility.
2011	Heritage Council of Ireland	<i>Improving the Accessibility of Historic Buildings and Places</i>	Ireland	Guideline / applied examples	Proposes the use of <i>reversible interventions</i> to enhance accessibility without compromising historic fabric.

2018	Total, O.	<i>Universal Access in Historic Environment and Accessibility of the Hacı Hasan Mosque in Eskişehir</i>	Türkiye	Field study	Identifies physical barriers such as ramps, level changes and wayfinding deficiencies; compliance with national standards is low.
2019	Hooi, P. M. and Yaacob, N.	<i>Accessibility for Physically Challenged Persons in Heritage Buildings</i>	Malaysia	Observation + evaluation survey	Finds perceptual and tactile guidance insufficient for visually impaired users; recommends portable ramp solutions.
2020	Lynch, S. and Proverbs, D. G.	<i>How Adaptation of Historic Listed Buildings Affords Access – International Journal of Building Pathology & Adaptation</i>	United Kingdom	Site investigation + case analysis	Highlights limitations imposed by conservation legislation; stresses the need for managerial awareness in implementing accessible solutions.
2022	Jeżyńska, A.	<i>Selected Aspects of Ensuring the Accessibility of Historical Buildings</i>	Poland	Literature review + local examples	Argues that accessibility must include cognitive and wayfinding dimensions, not only physical features.
2022	Marín-Nicolás, J. and Sáez-Pérez, M. P.	<i>An Evaluation Tool for Physical Accessibility of Cultural Heritage Buildings – Sustainability</i> 14(21), 15251	Spain	Quantitative scoring model	Classifies heritage buildings into five accessibility levels; accessibility varies by building type and function.
2023	Sáez-Pérez, M. P. and Marín-Nicolás, J.	<i>Design of a Support Tool to Improve Accessibility in Heritage Buildings – Buildings</i> 13(10), 2491	Spain	Digital tool development + case analysis	Develops a numerical decision-support tool; measures alignment between accessibility and conservation principles.
2025	Chidiac, S. E. and Reda, M. A.	<i>“‘True’ Accessibility Barriers of Heritage Buildings” – Buildings</i> 15(9), 1528	Egypt	Comprehensive field analysis	Categorizes barriers into physical, perceptual and managerial; emphasizes the critical role of cultural context in defining accessibility outcomes.

Research on accessibility in historic buildings in Türkiye (Table 3) has primarily focused on identifying physical access impediments, whereas the overarching balance between conservation and accessibility remains underexplored. Altın (2024), for instance, examined state museums and places of worship in the Ulus district of Ankara and found that "appropriate implementations are largely absent" based on measurements and visual assessments [18], [19]. Similarly, Körmeçli (2024) showed

that the historic tourism areas of Safranbolu face major accessibility problems, primarily due to the layout of the streets [20]. Çetiner (2018) further emphasized that accessibility at archaeological sites is not only a physical issue but is also interwoven with the concept of valorization, which concerns the site's cultural and symbolic significance [21].

These studies show that historic buildings in Türkiye don't comply with national accessibility standards, indicating low levels of compliance. They also show problems with navigation, ramps, and information systems. The Ministry of Culture and Tourism's 2021 Accessible Cultural Heritage Guide states that making historic buildings more accessible must comply with conservation rules. The 2018/2 Principle Decision of the High Council for the Conservation of Cultural Properties mandates that physical changes to cultural buildings must not damage the original fabric and, if required, should be removable or reversible. In this respect, national regulations are consistent with the European approach to reversible intervention.

Table 3. Summary of Accessibility Studies in Historic Buildings in Türkiye

Year	Author(s)	Study / Publication Title	Scope / Case Area	Method / Case Analysis	Key Findings
2018	Çetiner, M.	<i>An Inquiry into the Accessibility of Archaeological Sites for Persons with Disabilities</i>	Türkiye, archaeological heritage sites	Thesis research	Emphasizes that accessibility is intertwined with the cultural value (valorisation) of heritage sites, not limited to physical interventions.
2022	Altın, Ş. N. and Güngör, C.	<i>"The Importance of Accessibility of Historical Buildings"</i>	Türkiye, architectural context	Literature review + field observations	Concludes that cultural heritage assets are among "the most problematic areas" in terms of accessibility.
2024	Altın, Ş. N.	<i>Evaluation on Accessibility in Historical Environments ...</i>	Ankara, Ulus district	Field measurements + visual analysis	Identifies physical barriers such as lack of ramps, insufficient wayfinding and inadequate accessible entrances.
2024	Körmeçli, P. Ş.	<i>Accessibility of Urban Tourism in Historical Areas ...</i>	Safranbolu, Türkiye	Street morphology analysis + space syntax	Demonstrates that the historic street network directly affects the accessibility of urban tourism areas.

Recent studies emphasize that accessibility is not merely a physical challenge but also a social and management dilemma, necessitating a multifaceted examination within heritage contexts [6], [7]. The theoretical underpinnings of accessibility can be elucidated through the interplay between the Universal Design Principles [22] and the conservation principles delineated in the Burra Charter (ICOMOS 2013). In this context, the implementation of universal design in historic structures requires

evaluating not only physical conditions but also ethical, cultural, and administrative factors [1], [8].

As a result, accessibility in historic places is more than just a technical part of modern architecture; it is also a cultural right and a duty to protect the past. Based on this theoretical framework, the following section evaluates the accessibility conditions of the Edirne Old Mosque by examining its structure, the surrounding landscape, the entrance levels, access to the women's gallery, and possible ways to improve accessibility.

3. METHODOLOGY

3.1. Edirne Old Mosque as the Case: Architectural Characteristics of the Building

The Edirne Old Mosque, built in the early 15th century, is one of the best examples of the multi-domed mosque style of the early Ottoman period (Figure 3). The building lies in the middle of the city, at the intersection of Talat Paşa Boulevard and Saraçlar Street, an area with high pedestrian circulation. Approaches to the mosque are possible from the northern and eastern façades; however, the main entrance is accessed via several steps, which constitute a primary physical barrier, particularly for wheelchair users [11].

The mosque features a nine-domed plan layout, and the transitional space between the exterior and interior lacks contemporary accessibility elements such as ramps, thresholds suitable for wheelchair passage or elevators. Nonetheless, the surrounding open square and pedestrian axis present a potential to enhance physical access. Consequently, the study employs a comprehensive accessibility evaluation that considers both the mosque's structural-spatial attributes and its environmental-functional context.



Figure 3. General view of the Edirne Old Mosque, field survey archive, 2025.

3.2. Data Collection and Methodological Approach

The field study was conducted through repeated on-site visits during 2025, using a mixed-method approach that integrates qualitative observations with quantitative measurements (Figure 4). This combination facilitated the collection of data that is both comparable to international accessibility standards and pertinent to user experience and conservation principles. Data collection relied on direct observation, measurement, photographic documentation, and comparative evaluation methods. The collected data were systematically recorded and categorized to establish a comprehensive accessibility assessment framework. The evaluation process focused on identifying physical, perceptual, and environmental barriers while also considering conservation-sensitive intervention possibilities within the historic context. The obtained findings were subsequently interpreted in

relation to Universal Design Principles and international accessibility standards.

The data collection process was carried out in three stages:

1. On-site observation and measurement

Entrances, ramps, circulation areas, prayer space, and surrounding access routes of the mosque were photographed, while level differences were measured and mapped onto the site plan. These observations formed the basis for identifying physical barriers and spatial characteristics affecting accessibility.

2. Standards-based comparison

Measured data were compared with national and international accessibility criteria, including TS 9111 (2011), TS 12576 (2012), ADA Standards for Accessible Design (ADAAG 2010) [23], and the conservation principles outlined in the ICOMOS Burra Charter [5]. This enabled a comprehensive evaluation of the mosque within both local and global accessibility frameworks.

3. Analysis based on Universal Design Principles

The findings were qualitatively evaluated based on the seven Universal Design Principles established by Mace et al. in 1990 [22]. Each sub-component was evaluated using a 1–5 Likert-type scale, where 1 represents “not suitable” and 5 represents “fully compliant” (Table 4). This scoring system facilitated the interpretation of accessibility conditions in relation to both user needs and conservation considerations.

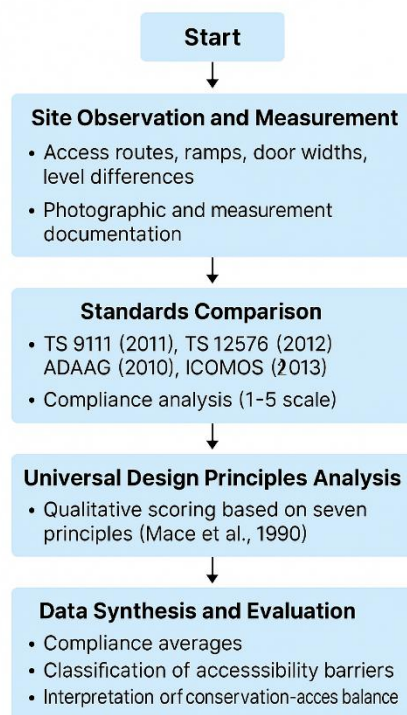


Figure 4. Research process flowchart

Table 4. Accessibility Evaluation Scale, adapted from [13], [17].

Score	Evaluation Level	Definition	Description / Criterion
1	Not suitable	Access or use is not possible.	No ramp; high steps; no wayfinding or tactile guidance.
2	Partially suitable	Access is restricted or unsafe.	Physical barriers exist; temporary solutions (e.g., portable ramps) are used.
3	Moderately suitable	Basic access is provided, but universal design principles are not fully met.	Door width and level differences are appropriate; information access is insufficient.
4	Largely suitable	The building is accessible for most users.	Ramps, wayfinding elements and visual–tactile contrasts are present.
5	Fully compliant	Accessible for all user groups; full alignment with universal design principles.	Physical, cognitive and visual accessibility are comprehensively ensured.

3.3. Evaluation Criteria and Analytical Method

The evaluation criteria employed in this study were established by amalgamating the prevalent requirements of national and international accessibility standards [9], [10], [5]. These criteria were grouped under five main categories:

1. Physical Accessibility: Ramps, stairs, level differences, and door widths.
2. Spatial Accessibility: Interior circulation, wayfinding elements, and the width of transitional spaces.
3. Environmental Factors: Lighting quality, surface texture, and material transitions.
4. Informational and Perceptual Accessibility: Signage, tactile surfaces, Braille information, and the use of visual contrast.
5. Temporal / Functional Accessibility: Ease of access during opening hours, particularly for high-mobility visitor groups.

For each category, accessibility conditions were identified through on-site observation, measurements, and photographic documentation. The level of compliance was expressed as a percentage. The criteria listed in Table 5 were established to provide a holistic evaluation of the physical, spatial, and perceptual dimensions of accessibility (Table 5). The accessibility score was calculated based on the seven Universal Design Principles using a five-point evaluation scale. Each principle was assigned a score between 1 and 5 based on the level of compliance identified through field observations, measurements, photographic documentation, and standards-based comparisons. The compliance percentage for each principle was calculated using the “Score/5x100” formula.

Accordingly, a score of 1 corresponds to 20% compliance, while a score of 5 represents full compliance (100%). The overall accessibility score was calculated as the arithmetic mean of the percentages obtained for the seven Universal Design Principles. This method enabled a systematic and comparable assessment of the mosque’s accessibility performance in relation to universal design and conservation criteria. Each parameter was scored through comparison with national and international accessibility standards, including TS 9111 (2011), TS 12576 (2012), ADA Standards for Accessible Design (2010), and the principles of the ICOMOS Burra Charter (2013).

Table 5. Accessibility Criteria and Parameters (based on TS 9111 (2011), TS 12576 (2012), ADAAG (2010) and ICOMOS (2013))

Category	Sub-criterion / Parameter	Standard Reference	Assessment Method
1. Physical Accessibility	Entrance ramps; stair riser height; level differences; door width	TS 9111 (2011); ADAAG (2010)	Field measurement; photographic documentation; slope calculation (maximum 6.25%)
2. Spatial Accessibility	Interior circulation width; clear passage width; ease of wayfinding	TS 12576 (2012); ADAAG (2010)	Plan measurement; user observation
3. Environmental Factors	Lighting level; surface texture; material continuity; thermal comfort	TS 9111 (2011); ICOMOS (2013)	Observational analysis; photographic documentation
4. Informational & Perceptual Accessibility	Signage; Braille information; wayfinding icons; use of visual contrast	ADAAG (2010); BS 8300 (2015); TS 12576 (2012)	Visual inspection, field observation
5. Temporal / Functional Accessibility	Opening hours; occupancy density; impact of temporary obstacles	ICOMOS (2013); TS 9111 (2011)	On-site observation; time-interval analysis

This analytical approach aligns with the evidence-based accessibility assessment framework proposed in the literature [24], [25]. The method incorporates on-site observation, accurate measurements, and systematic comparison with recognized accessibility standards. This framework enabled a systematic and comparable evaluation of accessibility conditions within the historic mosque environment. The results obtained through this process are presented in the following section under the heading Findings and Analysis for the Edirne Old Mosque.

4. FINDINGS AND ANALYSIS

4.1. Urban Approach and Environmental Accessibility

The Edirne Old Mosque is situated at the junction of Saraçlar Street and Talat Paşa Boulevard, a highly frequented pedestrian thoroughfare in the city. This central position offers potentially high accessibility. However, the current outdoor layout does not fully comply with the “continuous accessible route” principle defined in TS 12576 (2012).

Parking areas along Talat Paşa Boulevard are elevated above the pavement level, restricting safe passage for wheelchair users. Surface irregularities, excessive slope gradients and a lack of tactile guidance further disrupt the pedestrian route. For visually impaired users, interruptions in tactile surfaces, obstacles such as lamp posts, tree pits, and signboards create navigational difficulties (Figure 5).



Figure 5. Access routes around the mosque: 1–Approach from parking, 2–Main prayer hall entrance, 3–Entrance to the portico (based on Google Earth view, 2025)

Field observations revealed that the access routes display unsuitable elevation variances, deteriorated surfaces, and a lack of ramps. Many of the existing slopes exceed the maximum 6.25% gradient recommended by ADAAG (2010), contradicting the “environmental continuity of access” principle emphasized in BS 7913 [8]. Nevertheless, the large open square surrounding the mosque presents an opportunity: with appropriately designed ramps and continuous tactile surfaces, the area could potentially be improved in terms of accessibility using low-impact adaptive measures in accordance with international conservation principles. Figure 6 shows the pedestrian access to the entrance of the mosque.



Figure 6. Pedestrian paths leading to the mosque entrances, field survey archive, 2025.

4.2. Main Entrance and Interior Accessibility

The northern pedestrian approach has a pavement height averaging 22 cm and lacks a ramp or sloped transition, thereby posing a significant barrier for wheelchair users (Figure 7). The three-step staircase at the primary entrance violates Universal Design Principles 1 (Equitable Use) and 6 (Low Physical Effort) [4].

The stair risers are approximately 17 cm high with 30 cm treads; however, the smooth surface finish and lack of handrails compromise safety. Although the entrance door width (approx. 95 cm) is adequate for assistive devices, a 4–5 cm threshold restricts barrier-free passage. Portable metal ramps — as recommended by the Heritage Council of Ireland (2011) — could be introduced without affecting the building's authenticity.

The interior circulation width (min. 150 cm) is generally sufficient, but the carpeted floor complicates wheelchair maneuverability (Figure 8). Access to the upper women's gallery and lower-floor ablution facilities is impeded by constricted passages and stairways, contravening the "independent Access" stipulation outlined in TS 9111 (2011). Lighting levels inside the prayer hall range from 150 to 180 lux, which is insufficient for visually impaired users and hinders effective wayfinding [13].

The ablution and toilet facilities located in the immediate vicinity of the mosque also present significant accessibility challenges (Figure 9).

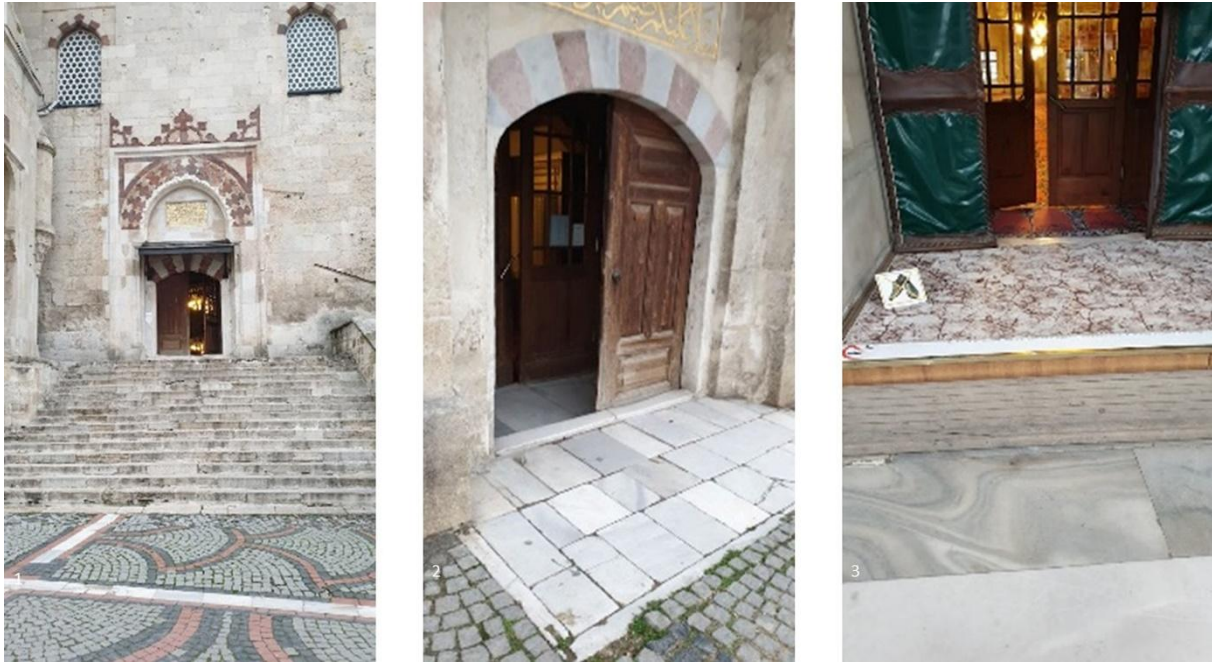


Figure 7. Entrance configurations: 1-From parking, 2-Pedestrian entrance to prayer hall, 3-Portico entrance, field survey archive, 2025.

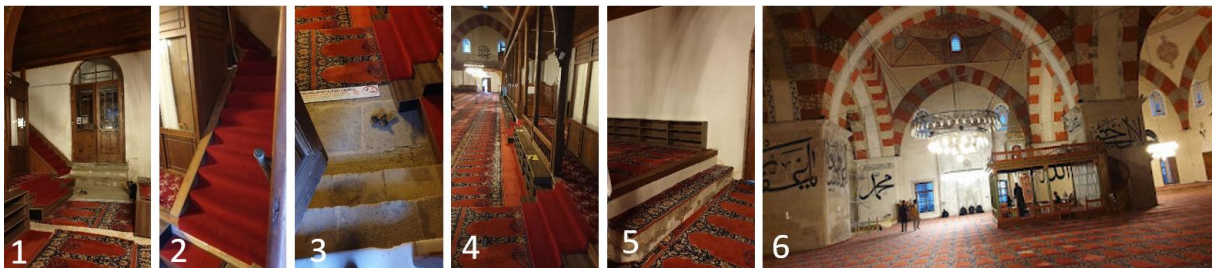


Figure 8. Interior photographs: 1-Entrance to imam's room, 2-Stairs to women's gallery, 3-Entrance zone, 4-Security desk, 5-Stairs to ground-floor women's area, 6-General view of prayer hall, field survey archive, 2025.



Figure 9. Nearby toilet and ablution facilities, field survey archive, 2025.

4.3. Informational and Perceptual Accessibility

The analysis indicates that informational signage is available only in Turkish and lacks Braille or tactile surfaces. The wayfinding icons and text size fail to comply with accessibility standards, and

the contrast levels are inadequate. These conditions contradict Universal Design Principle 4 (Perceptible Information) and BS 8300 (2015).

Additional observations include:

- No directional signage in the outer courtyard
- No tactile surfaces or color-contrast guidance inside the mosque
- Insufficient evening lighting, affecting both safety and navigation

In line with EMAA (2018), portable Braille panels and tactile ground surface indicators should be used to make information and perception more accessible [26].

4.4. Overall Assessment

The Edirne Old Mosque was evaluated against the seven Universal Design Principles using a 1–5 scoring system. The overall accessibility score was calculated as 46%, indicating limited compliance.

Table 6. Calculation of Accessibility Scores Based on Universal Design Principles

Universal Design Principle	Score (1–5)	Compliance (%)
1. Equitable Use	2	40%
2. Flexibility in Use	2	40%
3. Simple and Intuitive Use	3	60%
4. Perceptible Information	2	40%
5. Tolerance for Error	3	60%
6. Low Physical Effort	1	20%
7. Size and Space for Approach and Use	3	60%

Overall Accessibility Score:

$$(40 + 40 + 60 + 40 + 60 + 20 + 60) / 7 = 46\%$$

The findings indicate partial compliance in interior circulation and spatial sufficiency; however, significant deficiencies persist in outdoor access, informational guidance, and aspects requiring low physical effort. These scores directly relate to the physical, perceptual, and informational obstacles outlined in Sections 4.1–4.3. The discussion section further interprets these findings by linking each Universal Design Principle score to the relevant architectural and environmental observations.

5. DISCUSSION

The findings from the Edirne Old Mosque closely align with accessibility assessments of similar historic buildings across Europe and the Middle East. The overall accessibility compliance score of 46%, calculated from the average of the seven Universal Design Principle ratings shown in Section 4.4 (see Table 6; Figures 5–9), matches the average levels reported by Sáez-Pérez and Marín-Nicolás (2023). Hooi and Yaacob (2019) also highlight systemic issues in historic buildings, such as the lack of ramps and Braille signage. The entrance-level obstacles, inadequate wayfinding, and perceptual accessibility challenges observed in the mosque (Sections 4.1–4.3; Table 1) support this broader trend. These findings directly relate to the quantitative scores in Section 4.4, where the lowest-performing Universal Design Principles—Equitable Use (40%), Perceptible Information (40%), and Low Physical Effort (20%)—correspond with the physical and perceptual barriers noted in field observations (Sections 4.1–4.3). Conversely, the higher scores for Simple and Intuitive Use (60%) and Size and Space for Approach (60%) reflect the interior spatial organization described in the Results. This consistency demonstrates a clear connection between the measured accessibility indicators and the interpretative discussion below.

Accessibility in historic buildings is often seen as a balancing act between preservation and inclusive use. Feilden (2004) and ICOMOS (2013) emphasize “reversible intervention” as the most effective way to support user diversity without harming architectural authenticity. For the Edirne Old Mosque, non-invasive and removable solutions—such as portable ramps or lightweight threshold modifications—align with BS 7913 [8] and the recommendations of the Heritage Council of Ireland (2011). These approaches provide practical options to address the entrance stairs and threshold issues described in Section 4.2.

The findings also reveal that accessibility limitations are not solely physical; managerial and attitudinal dimensions play an equally significant role. Chidiac and Reda (2025) note that insufficient awareness and operational policies are among the most critical barriers to accessibility in heritage environments. The absence of portable accessibility solutions, lack of multilingual/Braille information, and inadequate evening lighting (<180 lux) identified at the mosque (Sections 4.2–4.3) reflect this challenge. In Türkiye, accessibility implementations often focus on technical adjustments, while user experience and perceptual accessibility tend to remain secondary [11].

From a Universal Design perspective, the mosque aligns partially with Principles 3 (Simple and Intuitive Use) and 7 (Size and Space for Approach and Use). In contrast, performance is weak in Principle 1 (Equitable Use), Principle 4 (Perceptible Information), and Principle 6 (Low Physical Effort) (Section 4.4). This supports previous research emphasizing that perceptual accessibility is essential for spatial accessibility [17]. Elements such as color contrast, standardized pictograms, continuous tactile surfaces, and adequate lighting not only help visually impaired users but also enhance navigation for elderly users and those with temporary mobility issues [16].

The mosque’s central location at the Saraçlar Street–Talat Paşa Boulevard intersection (Figure 5) offers a significant opportunity for accessible tourism and public inclusivity from an urban perspective. However, disruptions in the continuous pedestrian route, barriers at the pavement–road interface, and ramp gradients exceeding ADAAG’s 6.25% threshold (Section 4.1) hinder the realization of this potential. The UNESCO (2011) and ICOMOS frameworks highlight that cultural participation is a fundamental right; therefore, accessibility in symbolically essential buildings, such as the Edirne Old Mosque, is an ethical obligation. International examples recognized by the European Commission’s Access City Award show that reversible, low-impact, and experience-focused interventions can effectively improve accessibility without compromising authenticity.

In conclusion, while the mosque’s interior spatial layout (Section 4.2) offers a solid foundation, targeted, reversible, and standards-compliant interventions are necessary to address issues related to entrance levels, perceptual wayfinding, multilingual/Braille signage, and lighting. These changes would not only reduce physical barriers but also improve user experience and promote cultural participation, ultimately increasing the building’s public value. The quantified Universal Design Principle scores provide a clear framework for interpreting the architectural observations, reinforcing the validity of the discussion.

6. CONCLUSION AND RECOMMENDATIONS

This study evaluated the accessibility of the Edirne Old Mosque within the framework of Universal Design Principles, revealing how a historic structure engages with contemporary accessibility standards. The findings indicate that while the mosque has specific spatial strengths, it exhibits significant physical and perceptual barriers.

Overall:

- Lack of ramps and high entrance level differences constitute the main physical barriers in the exterior.
- Interior flooring and insufficient lighting pose risks, particularly for visually impaired users.
- Wayfinding and informational deficiencies—including the absence of tactile surfaces, directional signage, and Braille panels—limit user independence.

- Low perceptual accessibility reduces the quality of experience for diverse user groups.

Based on these findings, the following interventions are recommended:

1. Portable ramp and handrail systems

A removable metal ramp and supportive handrails should be installed at the entrance steps without damaging the original structure (Figure 10). Such reversible solutions are compatible with the principles of the Heritage Council of Ireland (2011) [27] and ICOMOS (2013) [5].

2. Installation of tactile ground surface indicators

Continuous tactile pathways from the northern entrance to the interior should be implemented to provide reliable orientation for visually impaired users [10].

3. Braille information panels and directional signage

Portable Braille maps and standardized signage indicating the prayer hall, ablution areas, and exits should be introduced in accordance with the perceptible information requirements of BS 8300 (2015) [28].

4. Lighting improvements and enhanced visual contrast

Light levels should be increased to at least 200 lux, particularly along circulation routes, at stair edges, and around the mihrab wall. High-contrast color cues should be added to improve navigation [13].

5. Managerial awareness and continuous monitoring

Following the suggestions of Chidiac and Reda (2025) [6], a specialized accessibility monitoring unit could be established within the Regional Directorate of Foundations. This unit would oversee regular assessments and incorporate user feedback into maintenance strategies.

These recommendations provide feasible, reversible, and conservation-sensitive improvements. Enhancing accessibility at the Edirne Old Mosque will promote cultural awareness, strengthen inclusive heritage practices, and improve the user experience for both residents and visitors.



Figure 10. Proposed intervention and solution examples, author's own work, 2025.

The results demonstrate that accessibility is not merely an architectural requirement but a crucial component of social policy and the democratization of cultural heritage. The Edirne Old Mosque illustrates how historic structures can be reinterpreted through Universal Design Principles, enabling meaningful integration between past and present societal values.

Ultimately, integrating accessibility into conservation policy represents one of the most significant steps toward sustainable heritage management [1], [5]. This approach ensures not only the preservation of historic environments but also their full enjoyment and shared use by all members of society.



Peer-review: External, Independent.

Acknowledgements:

-

Declarations:

1. Statement of Originality:

The authors declare that this manuscript is original, has not been published previously, and is not currently under consideration for publication elsewhere.

2. Author Contributions:

Concept: BM,AZ; **Conceptualization:** BM,AZ; **Literature Search:** BM,AZ; **Data Collection:** BM,AZ; **Data Processing:** BM,AZ; **Analysis:** BM,AZ; **Writing – original draft:** BM,AZ; **Writing – review & editing:** BM,AZ.

3. Ethics approval:

Not applicable.

4. Funding/Support:

This work has not received any funding or support.

5. Competing Interests:

The authors declare no competing interests.

6. GenAI Usage Statement:

Generative artificial intelligence tools were used solely for Turkish-to-English translation. No generative AI tools were used in the research, analysis, interpretation of findings, or generation of scientific content. The authors reviewed and verified the final text and take full responsibility for its content.

7. Sustainable Development Goals:



REFERENCES

- [1] Feilden, B.M. (2004), Conservation of Historic Buildings, 3rd ed., Routledge, London.
- [2] United Nations (2006), Convention on the Rights of Persons with Disabilities (CRPD), United Nations, New York, NY. <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

- [3] Steinfeld, E. and Maisel, J. (2012), *Universal Design: Creating Inclusive Environments*, Wiley, Hoboken.
- [4] Center for Universal Design (1997), *The Principles of Universal Design (Version 2.0)*, North Carolina State University, Raleigh, NC. Available at: <https://design.ncsu.edu/wp-content/uploads/2022/11/principles-of-universal-design.pdf>
- [5] International Council on Monuments and Sites (ICOMOS) (2013), *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*, Australia ICOMOS, Sydney.
- [6] Chidiac, S.E. and Reda, M.A. (2025), "'True' accessibility barriers of heritage buildings", *Buildings*, Vol. 15 No. 9, Article 1528. <https://doi.org/10.3390/buildings15091528>
- [7] Marín-Nicolás, J. and Sáez-Pérez, M.P. (2023), "Design of a support tool to improve accessibility in heritage buildings — application in case study for public use", *Buildings*, Vol. 13 No. 10, Article 2491. <https://doi.org/10.3390/buildings13102491>
- [8] British Standards Institution (BSI) (2015), *BS 7913: Guide to the Principles of the Conservation of Historic Buildings*, BSI, London.
- [9] Turkish Standards Institute (TSE) (2011), *TS 9111: Accessibility Requirements for Buildings for People with Disabilities and Limited Mobility*, TSE, Ankara.
- [10] Turkish Standards Institute (TSE) (2012), *TS 12576: Design Rules for Structural Measures and Markings for Accessibility on Urban Roads and Pedestrian Crossings*, TSE, Ankara.
- [11] Tural, O. (2018), "Universal access in historic environment: The Hacı Hasan Mosque case study", *International Journal of Architecture & Planning*, Vol. 6 No. 1, pp. 126-141.
- [12] Ministry of Family and Social Services (2013), *Accessibility Monitoring and Inspection Regulation*, Resmi Gazete, 20 July 2013, No. 28713.
- [13] Hooi, P.M. and Yaacob, N. (2019), "Accessibility for physically challenged persons in heritage buildings", *Journal of Design and Built Environment*, Vol. 19 No. 1, pp. 24-39.
- [14] Sawyer, A. (2015), *Easy Access to Historic Buildings*, 3rd ed., Historic England, London.
- [15] Adams, J. and Foster, L. (2004), *Easy Access to Historic Buildings*, English Heritage, London.
- [16] Jeżyńska, A. (2022), *Selected Aspects of Ensuring the Accessibility of Historical Buildings*, Politechnika Lubelska, Lublin.
- [17] Marín-Nicolás, J. and Sáez-Pérez, M.P. (2022), "An evaluation tool for physical accessibility of cultural heritage buildings", *Sustainability*, Vol. 14 No. 21, Article 15251. <https://doi.org/10.3390/su142215251>
- [18] Altın, Ş.N. (2024), "Evaluation on accessibility in historical environments: Ankara Ulus environment example", *ICONARP International Journal of Architecture & Planning*.
- [19] Altın, Ş.N. and Güngör, C. (2022), "The importance of accessibility of historical buildings", *Gazi University Journal of Social Sciences Part B: Art, Humanities, Design and Planning*, Vol. 10 No. 4, pp. 415-426. Available at: <https://dergipark.org.tr/en/download/article-file/2808781>
- [20] Körmeçli, P.Ş. (2024), "Accessibility of urban tourism in historical areas: Analysis of UNESCO World Heritage Sites in Safranbolu", *Sustainability*, Vol. 16 No. 6, Article 2485. <https://doi.org/10.3390/su16062485>
- [21] Çetiner, M. (2018), *An Inquiry into the Accessibility of Archaeological Sites for Persons with Disabilities*, Unpublished Master's Thesis, Middle East Technical University (METU).
- [22] Mace, R.L., Hardie, G.J. and Place, J.P. (1990), *Accessible Environments: Toward Universal Design*, Center for Accessible Housing, Raleigh, NC.

- [23] Americans with Disabilities Act Accessibility Guidelines (ADAAG) (2010), 2010 ADA Standards for Accessible Design, U.S. Department of Justice, Washington, DC.
- [24] Karimi, K., Zhand, S., Simons, G., Abdeldayem, W.S., Charalambous, N. & Giraud, I. (2025), "Framing Evidence-Based Design and Planning: An Analytical, Multi-Scalar and Iterative Framework for Urban Design and Planning", *Urban Science*, 9(11), 457. <https://doi.org/10.3390/urbansci9110457>
- [25] Lynch, S. and Proverbs, D.G. (2020), "How adaptation of historic listed buildings affords access", *International Journal of Building Pathology and Adaptation*, Vol. 38 No. 5, pp. 589-605. <https://doi.org/10.1108/IJBPA-12-2019-0103>
- [26] EMAA (2018), *Access to Heritage Places Guidelines VIC*, Kingston, ACT. Available at: https://www.emaa.com.au/uploads/4/6/3/2/46326229/20180112_access_to_heritage_buildings_guidelines_vic.pdf
- [27] Heritage Council of Ireland (2011), *Improving the Accessibility of Historic Buildings and Places: A Practical Guide to Meeting the Needs of People with Disabilities*, Dublin. Available at: <https://www.heritagecouncil.ie/content/files/Improving-the-Accessibility-of-Historic-Buildings-and-Places-2011.pdf>
- [28] British Standards Institution (BSI) (2015), *BS 8300-2: Design of an Accessible and Inclusive Built Environment – Buildings – Code of Practice*, BSI Standards Limited, London.
- [29] U.S. Access Board (2010), *ADA Accessibility Guidelines (ADAAG)*, U.S. Government Printing Office, Washington, DC.

