

Visual Perception of Universal Design Interventions for World Heritage Sites: Case of Istanbul Historic Peninsula

Buse Ceren Ener

Yıldız Technical University/Istanbul Beykent University
b.c.sengul@gmail.com

Erhan Kurtarir

Yıldız Technical University
erhankurtarir@gmail.com

Abstract

Universal Design is defined with seven principles for enhancement of inclusivity for various fields of design. Some enhancements are especially aimed to be visibly highly noticeable, so they can be used intuitively, self-directing the audience with added visibility and attention. However, when it comes to urban heritage sites visual unity and coherence brings heritage value. Therefore, potentially the addition of highly visible indicators might be contradicting with the idea of the nature of interventions. Core tension of this study is the conflicting nature between inclusive urban design applications and conservation policies for World Heritage Sites where minimum intervention aimed. In-depth interviews with users of public spaces in Historic Peninsula Istanbul conducted, results will be discussed to reach parameters for universal design tools for heritage sites.

Keywords: Inclusivity, Public Space, World Heritage Sites, Accessibility, Universal Design

Introduction

Universal Design refers to designing environments and services to be usable by all people to the greatest extent possible. In the context of World Heritage Sites (WHS) protected under UNESCO's World Heritage Convention applying UD principles means making historical urban environments inclusive for people with disabilities, the elderly, and other disadvantaged groups. Yet this must be done sensitively so as not to compromise heritage integrity or authenticity (WHC, 2025) defined as Outstanding Universal Value. The Historic Peninsula of Istanbul, consists of four districts that covered the WHS (Topkapı Archaeological Park, Süleymaniye District, Zeyrek District, and City Walls) selected as the case study area since the sites are both home for millions of residents plus millions of tourists visiting every year. Historic core with its narrow-cobbled streets and dense tourism make accessibility a challenging question itself as well as universal design. "Should demands for access for all be ignored to satisfy calls for heritage conservation, or vice versa?" is the core question and efforts for new approaches recognise that both goals may coexist (McClelland, 2022).

Scope and Aim

This paper studies how universal design principles can be applied in urban design, management and planning for World Heritage sites to enhance inclusivity without losing the heritage integrity. Istanbul's Historic Peninsula selected as a case study area and the study aims to find out the visual perception of inclusivity interventions in physical space and how public spaces in historic urban districts can be modified with respect to the parameters that the study will explore. The study investigates the research question of Is it possible and if so how it is possible to integrate inclusive design to urban heritage sites especially World heritage sites so that the outstanding universal value would not be compromised? Literature review starts with bibliometric analysis with searching keywords world heritage sites and inclusive design in both Scopus and Web of Sciece platforms. The sources found are briefly referd part of the literature review and the methodology is conducted in accordance with the priliminary research. Methodology of the study is consisting of two parts where methodwise extensive and intensive research approaches for social sciences reseach by Sayer (2010) is adopted and withing that proceedings paper the intensive research part is conducted and the first part resultts are given place. In-depth interviews are conducted with a small group of participants as the intensive research where the extensive research approach is planned as the second part of the further studies as a more integrative and comprehensive approach. Core

argument is shaping around the fact that with universal design it is possible designing environments usable by all people, for people with disabilities, the elderly, families with children and so on while respecting historic character. Special attention is given to visual perception tools such as interpretive signage, tactile maps, guided transitions, and multi-sensory wayfinding, discussing how they can be adapted in heritage contexts. After the in-depth interview is decoded and analyzed the main themes will be listed to construct the parameters for inclusive design in heritage areas. Historic urban areas such as the zones mentioned part of Istanbul's Historic Peninsula are complex urban settings to bring together public and stakeholder engagement together for public good and also another question of ethics of the subject embedded at the core of the world heritage as the words meanings trying transfer the message of the site is not just a property of a country or a specific city yet they belong to all human-kind; even the ones who are not born yet.

Focusing on the core conflicts mentioned above study aims to find how to enhance the visual perception of the inclusive design indicators for a public space with an urban heritage value; especially for the World Heritage Sites without causing disturbance on the value of the site?". While maintaining the main emphasis on universal design principles, how can site-specific urban design solutions can apply and how they will be perceived by the users of public space is the scope of this research. After the case study finally the results and conclusion aim to discuss and find out the possible parameters for universal design tools specifically of heritage sites.

Literature Review

Urban heritage conservation and accessibility are traditionally seen as separate goals, but growing consensus questions otherwise as mentioned. Universal design extends beyond basic accessibility standards; it is an inclusive philosophy is changing the heritage preservation perspectives as well. For 2030 Unesco and WHC is determining strategies for cultural inclusion as well as sustainability and accessibility. Capacity building is another important part highlighted under the inclusivity framework for heritage conservation in real life practices (UNESCO WHC, 2025).

Importantly, UD is distinguished from merely meeting minimum accessibility codes. While accessibility often focuses on enabling people with disabilities to use a place (usually via specialized features like ramps or lifts), UD assumes the primary design solution accommodates everyone. In other words, where accessibility might add a separate solution, The inclusive design approach means that installations (e.g. elevator, ramp, signage) benefit not only disabled persons but all users, thus investing in universal access yields broad social and economic benefits (Darcy, 2006).

Applying UD in heritage sites raises concerns about preserving authenticity and integrity. International charters that heritage places should retain their historical fabric, which can conflict with modern interventions. However, recent thinking suggests that inclusion is part of sustainability and continuity of heritage. UNESCO and ICOMOS support integrating disabled access into cultural heritage as part of living heritage preservation. For example, UNESCO's "Making Culture Accessible" initiative notes that cultural heritage sites should be experienced by all and that existing infrastructure should be adapted for both disabled and non-disabled. (UNESCO WHC, 2025) A Norwegian government report on heritage and universal design likewise asserts that everyone "expects to be able to experience monuments and sites in an equal manner" and encourages local solutions that balance access with conservation (Norwegian Ministry of Environment et al, 2010) This affirming with thoughtful design, inclusivity can be built into heritage environments without undermining their values.

On the other-hand the application itself is also a challenge even if the aim is constituting this basis of awareness of inclusive design. Urban heritage areas present specific challenges: they often have uneven terrain, narrow streets, cobblestones, stairs, and tightly spaced buildings. Diken and Onur (2022) observe that streets and public spaces in historic city sites seldom incorporate UD principles due to "topographic problems and inadequacies in existing traditional areas" Integrated approaches – such as pedestrianizing streets, improving pavements, and designing public furniture accessibly – are recognized as part of sustainable urban heritage management.

Heritage sites are mostly sites that are unfamiliar to many visitors being there the first time in their lives. Therefore wayfinding is one of the key concepts of visual perception related to space. Visual perception tools such as signage, maps, digital media guide visitors through complex historic environments. Adapting these tools universally means considering diverse sensory and cognitive needs.

Traditional signage at heritage sites must balance readability with aesthetics. To serve all visitors, interpretive signs should use high-contrast, large fonts on plain backgrounds, avoiding visual clutter. Importantly, signs can include tactile elements and Braille. Multisensory tools are another important concept of visual perception of the inclusivity tools as they would be integrated to the actual physical site. Multisensory features do not compromise heritage imagery; rather, they enrich engagement. A heritage site could pilot such an accessible sign in a courtyard or entrance area to enhance inclusivity. Even digital displays (e.g. touchscreen kiosks) can follow principles of universal design as they should have audio output, haptic feedback, and simple interfaces compliant with universal design standards.

As mentioned above orientation in a heritage district can be challenging due to irregular layouts. At this point the Tactile (3D) surfaces or maps placed at key nodes can visually impair visitors. These maps generally use raised contours and textures for buildings and terrain, often accompanied by Braille labels. They must be located at accessible height and located at logical transitions (e.g. station exits, major squares). For universal design, the same map should be usable by all: e.g., a map with clear pictograms and text can serve general visitors, while the raised features serve visually impaired users as referring to Equality principle of universal design.

İnalhan and Ergeneoğlu (2010) define disabled customer's market as an important niche market for the tourism industry. "A Disabled person's willingness to travel may vary according to their hearing, speaking, seeing, or orthopedic disabilities. Therefore, people's disabilities should be considered when designing indoor" (Kahraman, 2019, p.5). In a historic site, moving from one space to another (e.g. from street to building interior, or between elevations) can be disorienting if not handled well. Universal design advocates "same route" access, meaning everyone should follow the same circulation path. For example, a grand museum entrance should have a ramp integrated alongside steps, rather than a hidden side entrance. At Hagia Sophia or Topkapı Palace, this could mean designing unobtrusive ramps at entrances so that wheelchair users and those with strollers enter through the main gate. Similarly, textured paving or gentle level changes can signal transitions between public squares and building forecourts. "All users follow the same routes through the site" and that primary entrances should have no step (National Park Service, 2025). Lighting and subtle wayfinding markers (e.g. distinct floor patterns) can guide visitors smoothly without altering historic thresholds.

Methodology and Case Study

As the study uses a qualitative review of relevant literature, policy documents, and case reports, supplemented by illustrative examples from Istanbul's Historic Peninsula; both white literature and grey literature; to construct the foundation of the in-depth interview questions the visual perception, world heritage sites and inclusive design are taken as key themes. Key sources include academic studies on accessibility, UNESCO guidelines and decisions, engineering and design reports on the Istanbul Historic Peninsula. The discussion is organised thematically: first reviewing universal design concepts in heritage contexts, then examining visual perception and wayfinding adaptations, and finally analyzing Istanbul-specific challenges and practices. This approach highlights both theoretical guidance and concrete urban design interventions.



Figure 1 Istanbul Historic Peninsula World Heritage Site Zones. (WHC, UNESCO, 2025 retrieved from <https://whc.unesco.org/en/list/356/maps/>)

Istanbul's Historic Peninsula faces typical constraints of a layered heritage environment: ancient Byzantine walls, Ottoman mosques and palaces, mixed-use bazaars, and a labyrinthine street network. These physical conditions, plus heavy tourism, create both barriers and catalysts for universal design. Over recent decades, local planners have pursued projects that implicitly apply universal design and inclusivity principles, starting with integration of public transportation, pedestrianisation, enhanced wayfinding systems and maybe last but not the least important one as the social inclusion indicators.

Public transportation is one of the major determinants of accessibility and inclusivity as the ramps and related assistive layout is missing in most of the public transit stops and stations (Evcil, 2009). This might bring the thought of most people with disability do not feel welcomed or do not feel they have the chance to join city life and leave their homes. Pedestrianisation is another aspect of accessibility studies, on contrasting levels; with groups supporting the idea or opposing to this particularly. Between years 2005–2012 Istanbul undertook major pedestrianization in the Peninsula. Streets were repaved with smooth granite, obstacles removed, and service corridors. As a result, bollards, curbs and barriers that once hindered wheelchairs were gradually removed. Many people opposed to the projects as the retail sectors are mostly negatively effected by those kind of physical interventions (Öztaş and Akı, 2014).

Results and Discussion

The study adopts two partile method combinin extensive and intensive resarch methods as Sayer (2010) defines. This part of the study focusing on the background of the subject and tries to understand the mechanisms and

perception, awareness and social structure behind inclusivity on site. As a part of this intensive approach the Google Earth street view tool is used for the digital documentation of the physical structure and its change through time. For example a related image is given at Hagia Sophia adjacent street between 2023-2024 there had been an implementation on the pavements with high contrast level yellow pavement lines painted on the street to draw extra attention to the level differences on the road and pedestrianised area (Please see figure 2 and figure 3).

Indepth interviews showed that 5 participants all mentioned the tactile pavements and yellow lines used for visual impairments yet did not notice the info desks or other supportive indicators. The emphasis is mostly on the visually impaired and the wheelchairs users when disabilities are concerned. Neuro-diversity is totally neglected none of the participants know the topics and its relationship to the inclusivity or universal design.



Figure 2 Additional Attention Yellow Path is added at 2023 and 2024 in Sultanahmet District (Photo produced by Buse Ceren Ener using the digital source Google Earth)



Figure 3 Additional Attention Yellow Path is added at shown near Hagia Sophia, years 2023 and 2024 in Sultanahmet District (Photo produced by Buse Ceren Ener using the digital source of Google Earth)

Conclusion

This study can be taken as a preliminary study, a first step towards an extended further researches on the site. Its importance lies at the future attributes where future social inclusion and capacity building is on the agenda. To sum up all this, it should be underlined again that UNESCO World Heritage status imposes strict conservation regulations that often require heritage authority approval for any physical interventions, including accessibility features, to ensure they are reversible and visually unobtrusive. As this applies all world heritage sites the case study area Istanbul is particularly difficult to be approached as the metropole has over 15 million residents and numerous visitors. Institutional coordination is another major challenge, as overlapping responsibilities between municipal, district, and national agencies can delay universal design (UD) projects. Should also address the main limitation is that since Istanbul is a very complex case to study it is difficult to take visual perception as an independent attribute.

Socially and economically, universal design presents clear benefits: it enhances tourism by expanding accessibility for international visitors while also improving quality of life for residents, including the elderly and pregnant women. Evidence from other heritage cities shows that accessible environments contribute to increased tourism satisfaction, dwell time, and spending in heritage zones.

Universal design offers a path to greater inclusivity at heritage sites like Istanbul's Historic Peninsula while upholding conservation goals. The principles of UD – equitable use, perceptible information, tolerance for error, etc. – can be applied in urban heritage planning to create spaces and tools that welcome all visitors. Key strategies include designing shared accessible routes, deploying multisensory interpretive media, and carefully integrating access features into historic contexts (UNESCO, 2025). Although challenges exist (physical constraints, regulatory complexity, institutional coordination), the opportunities are significant: enhanced visitor experience, compliance with human rights frameworks, and alignment with sustainable development goals. Future efforts should focus on comprehensive management plans that explicitly incorporate universal design, continued stakeholder engagement, and pilot projects showcasing innovative wayfinding technologies. By doing so, Istanbul can become a model for how World Heritage Cities. "Disability ought to be regarded as an instance of diversity, not as a limitation" says Falt and Manocha, (2019) addressing India's perspective as many other countries that now opening inclusivity universal design and heritage horizons, for further studies and geographies.

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