

# Accessible Heritage Tourism Through Universal Design: A Case Study of Peneleh, Surabaya

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## **Abstract**

*Peneleh Village, the oldest settlement in Surabaya, is a heritage area rich in historical and architectural value, offering considerable potential as a cultural tourism destination in East Java. Within the scope of sustainable tourism development, accessibility is a crucial element for ensuring inclusivity, comfort, and equal opportunities for all visitors. This study investigates the current state of accessibility in Surabaya's Old Town through universal design, prioritizing usability, safety, and clarity in public spaces without discrimination. A qualitative descriptive method was adopted, incorporating field observations, in-depth interviews with local stakeholders and tourists, and a review of heritage planning documents and regulatory frameworks. Findings indicate that many infrastructure elements in Peneleh Village do not comply with universal design standards. Out of 35 assessed indicators, only 22.86% were fully implemented, 11.43% were partially implemented, and 65.71% were not implemented—highlighting a significant gap in accessibility provision. Key issues include uneven pedestrian pathways, inadequate visual signage, and a lack of inclusive public facilities. The study presents strategic recommendations to enhance accessibility and reposition Peneleh as a user-centered and inclusive heritage destination. Improving accessibility through universal design enriches visitor experience and contributes to more sustainable and equitable cultural tourism.*

**Keywords:** Accessibility, Universal Design, Heritage Tourism, Inclusive Tourism, Peneleh Village.

## **INTRODUCTION**

Heritage areas preserve historical values, shape urban identity, and foster culture-based tourism. In the context of rapid urban modernization, the challenge of managing heritage spaces extends beyond physical conservation to ensuring equitable access and enjoyment for all members of society. The concept of inclusivity in public spaces has increasingly gained attention, aligning with global discourse on spatial justice and accessibility as key pillars of sustainable urban development.

In Indonesia, Surabaya—often called the "City of Heroes"—is home to one of the country's oldest urban settlements, Peneleh Village, along the Brantas River. The village was officially designated as a Heritage Tourism Area in 2018, following revitalization efforts initiated by the Soerabaia Youth Community (Nurany et al., 2023). Peneleh's heritage value is manifested in numerous well-preserved historical sites, including the House of H.O.S. Tjokroaminoto, Masjid Jami, the Birthplace of Bung Karno, Langgar Dukur Kayu, the Peneleh Dutch Cemetery, and traditional residential architecture (Najma et al., 2025).

In addition to its rich physical heritage, Peneleh is recognized for its community-led Walking Tours, facilitated by the local Tourism Awareness Group (Pokdarwis), whose members—many of whom are long-time residents—serve as knowledgeable local guides (Prathama & Idajati, 2024). This grassroots participation highlights the role of community agency in sustaining heritage tourism through storytelling and lived experience.

Despite its potential, accessibility remains a critical yet under-addressed issue in Peneleh. Many infrastructural components—such as pedestrian pathways, public amenities, and signage systems—fall short of universal design standards,

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emphasizing usability, safety, and inclusiveness for all users regardless of physical condition (Irish, 2020). Integrating universal design into the planning and management of heritage tourism sites offers a holistic framework for creating equitable, comfortable, and user-friendly environments.

This study explores how Peneleh can be transformed into a more inclusive and sustainable heritage destination by addressing three core research questions. First, it assesses the current state of accessibility in Peneleh using the seven universal design principles. Second, it identifies infrastructural and informational barriers that limit usability for diverse visitor groups, including people with disabilities. Third, it proposes strategic recommendations to enhance accessibility while maintaining the site's historical authenticity and cultural value.

## **LITERATURE REVIEW**

### ***Accessibility***

Accessibility is a fundamental aspect of tourism development, defined not only as the ease of reaching a destination in terms of geographical proximity or transportation availability, but also as the overall capacity of an environment to accommodate diverse visitor needs (Rossadi & Widayati, 2024). It is commonly categorized into two dimensions: physical and non-physical. Physical accessibility encompasses infrastructure and built environments that facilitate visitor mobility and comfort, such as pathways, entrances, and public facilities. In contrast, non-physical accessibility refers to the availability of clear, user-friendly information and communication systems that support tourists in navigating and experiencing destinations effectively (Poerwanti & Utama, 2021).

At the global level, universal accessibility has been institutionalized through the United Nations World Tourism Organization (UNWTO) Recommendations on Accessible Tourism for All. These guidelines, formalized in General Assembly Resolution A/RES/637(XX), emphasize that tourism environments should be designed so that "all people, regardless of any functional limitations, disabilities or age, can enjoy tourism in a manner that is equitable, dignified and independent" (UNWTO, 2013). The UNWTO framework is a global reference for integrating accessibility into tourism policies and practices. National and local governments have echoed these principles. For instance, Surabaya Mayor Regulation No. 9 of 2024 mandates the provision of accessible public infrastructure and workspaces, particularly for persons with disabilities. These regulatory frameworks reinforce the need for inclusive design approaches integrating physical infrastructure, information access, and institutional support.

These perspectives highlight that accessibility is not merely a technical requirement but a multidimensional concept intersecting with equity, inclusion, and sustainability in tourism planning. However, there remains a lack of empirical research examining the application of universal accessibility frameworks within heritage tourism settings in Indonesia—particularly in historic urban districts such as Peneleh. This study seeks to address this gap.

### ***Heritage Tourism***

Heritage, as a cultural legacy, serves as a continuum that bridges the past, present, and future. It encompasses tangible elements such as monuments and artifacts and intangible dimensions including inherited skills, symbolic representations, and collective memory, all of which function as markers of identity and distinct social belonging (Bitušíková, 2021). Heritage tourism, one of the earliest forms of travel, has evolved into a significant sector within the global tourism industry. It refers to visiting sites associated with cultural, natural, or intangible heritage, aiming to provide tourists with meaningful connections to the past and a deeper understanding of cultural narratives embedded within specific destinations (Brooks et al., 2023).

More than just visual appreciation, cultural heritage tourism facilitates direct engagement with local communities' customs, traditions, and daily lives. This immersive participation fosters authenticity, promotes educational enrichment, and strengthens emotional and spiritual bonds between visitors and host cultures (Rachmawati et al., 2024). In this context, the involvement of local communities is essential—not only as custodians of heritage but also as active participants in co-creating cultural tourism experiences. The revitalization of heritage areas is distinct from other forms of tourism development due to the imperative to preserve historical and cultural values. Nevertheless, enhancing accessibility within heritage sites is both necessary and permissible, provided that interventions maintain the cultural and architectural integrity of the site. This is reinforced by Indonesian Law No. 11 of 2010 on Cultural Heritage, Article 82, which states that cultural heritage structures may be adapted to meet contemporary needs as long as the original characteristics—such as façades, cultural landscapes, and ground surfaces—are preserved.

## **Universal Design**

Universal Design (UD) refers to the development of products, environments, and systems that all people use to the greatest extent possible, without the need for adaptation or specialized design. Originally conceived with the general population in mind, the concept has evolved to address a broader range of user needs, including those of persons with disabilities, older adults, and other groups with diverse physical or cognitive abilities (Goldsmith, 2007). In urban development, UD is increasingly linked with sustainability and social inclusion, as design choices directly influence the extent to which cities are equitable and accessible. Failure to integrate UD principles into urban planning and densification efforts can reinforce social exclusion and deepen spatial inequalities (Müller, 2023).

Central to Universal Design is recognizing that individuals possess varying physical characteristics and abilities. The built environment must accommodate this diversity to ensure equitable access and inclusive experiences (Wan, 2024). From this perspective, research on urban design must consider not only aesthetic and functional concerns but also the social and health implications of spatial interventions—particularly in historic or high-density urban areas. The foundational framework for UD is articulated in its seven core principles, which guide inclusive design practices across various spatial and programmatic contexts: 1) Equitable Use – Design accommodates people with diverse abilities in a non-stigmatizing manner; 2) Flexibility in Use – Design accommodates a wide range of individual preferences and abilities; 3) Simple and Intuitive Use – Design is easy to understand, regardless of the user's experience or literacy; 4) Perceptible Information – Design communicates necessary information effectively, regardless of sensory abilities; 5) Tolerance for Error – Design minimizes hazards and adverse consequences of unintended actions; 6) Low Physical Effort – Design can be used efficiently and comfortably with minimal fatigue; 7) Size and Space for Approach and Use – Design provides appropriate size and space for approach, reach, and use, regardless of user's body size, posture, or mobility.

These principles have been adopted and promoted by global institutions such as the United Nations World Tourism Organization (UNWTO), particularly in its 2013 Recommendations on Accessible Tourism for All, which advocate for tourism environments that are equitable, dignified, and independent for all users. While the theoretical and normative frameworks for UD are well established globally, there remains a need for localized empirical research on how these principles are implemented—especially within the context of heritage tourism in developing urban environments such as Peneleh.

## **METHODS**

This study adopts a descriptive qualitative approach to explore the extent to which Peneleh Heritage Tourism accommodates universal design principles regarding accessibility. Qualitative inquiry is particularly appropriate for tourism research, as it facilitates an in-depth understanding of complex socio-spatial phenomena, especially those involving human experiences, perceptions, and contextual realities (Goodson, 2004; Mackiewicz, 2018). This approach allows the researcher to examine not only the physical aspects of accessibility but also how users interact with and perceive the built environment (Furidha, 2024).

Fieldwork was conducted over five weeks, enabling multiple site visits and robust triangulation of data sources. Primary data were collected through: 1) Field Observations: Systematic assessments of 35 accessibility indicators based on the seven universal design principles. Observations covered pedestrian pathways, signage, public amenities, and circulation spaces; 2) Semi-Structured Interviews: Conducted with four key informants representing both the management and user sides of heritage tourism: a) the head of the local Tourism Awareness Group (Pokdarwis), b) a museum staff member at the House of H.O.S. Tjokroaminoto, and c) two domestic tourists from Sidoarjo and Surabaya; 4) Documentation: Field notes, photographs, and internal reports were compiled to support observational and interview data.

Supporting data were gathered from peer-reviewed journal articles, previous research reports, policy documents, and regulations related to universal design and tourism accessibility—particularly UNWTO's "Accessible Tourism for All" framework and Surabaya Mayor Regulation No. 9/2024. Data were analyzed through a three-stage qualitative process: 1) data reduction (selecting relevant findings and discarding redundancy), 2) data presentation (organizing field data thematically), and 3) conclusion drawing. The analysis aimed to evaluate how well current infrastructural and informational conditions align with the seven principles of universal design, thereby assessing the inclusivity of the site for diverse visitor groups.

## **RESULTS AND DISCUSSION**

### ***Study Context: Peneleh as a Heritage Tourism Site***

Peneleh Village, located in central Surabaya, is one of the city's oldest urban settlements, featuring a rich assemblage of religious, colonial, and vernacular architecture. Officially designated as a Heritage Tourism Area in 2018, it is home to several key historical sites that form the backbone of its cultural landscape. One such landmark is Masjid Jami Peneleh, established in 1421 by Sunan Ampel. It remains one of Surabaya's oldest mosques and symbolizes early Islamic influence in the region. The mosque features traditional wooden carvings and has retained its original function as a place of daily worship.

Another significant site is the H.O.S. Tjokroaminoto Museum, located at Jalan Peneleh Gang VII No. 29–31. The building was the residence of H.O.S. Tjokroaminoto, a prominent nationalist figure. The colonial-style house was designated a protected cultural heritage asset under Surabaya Mayor's Decree No. 188.45/251/402/1996 and Register No. 55/2009 (Najma et al., 2025). The Langgar Dukur Kayu, a small mosque built in 1893, also contributes to the area's historical narrative. It served as a key meeting point for religious leaders and nationalist youth groups, including H.O.S. Tjokroaminoto himself, during the colonial era.

Additionally, the Peneleh Dutch Cemetery, inaugurated in 1847, spans 6.5 hectares and contains the graves of Dutch colonial officials. It provides insight into the influence of European urban planning and funerary architecture in 19th-century Surabaya. These cultural assets, while representing significant heritage value, also present challenges in terms of accessibility. As this study demonstrates in subsequent sections, many of these sites remain only partially accessible to visitors with diverse physical and cognitive needs, thus necessitating a critical evaluation through the lens of universal design.

### ***Accessibility Evaluation Based on the Seven Principles of Universal Design***

#### ***Equitable Use***

The first principle of Universal Design emphasizes equal access for users regardless of age, ability, or background. Field observations reveal that Peneleh Heritage Village has not fully realized this principle. While several pathways are free of steep staircases, allowing relatively easy access, key attractions such as the House of H.O.S. Tjokroaminoto and the museum lack accessible toilet facilities. Narrow entrances and the absence of ramps hinder mobility for users with disabilities. A museum staff member explained that the interior flooring of the Tjokroaminoto House has been preserved in its original form to maintain historical authenticity. However, this creates physical barriers for wheelchair users. As a mitigation strategy, portable ramps could be introduced—offering a non-invasive solution that upholds conservation and accessibility goals.



**Figure 1. The Interior Flooring of the H.O.S. Tjokroaminoto museum**

Source: Research Data, 2025

In addition, there is a complete absence of designated parking areas for visitors. Most tourists are forced to park outside the heritage zone, with limited space near cafés such as Lodji Besar. Several internal alleyways prohibit motorcycle use to preserve traditional norms, but this presents further challenges for visitors with reduced mobility. These constraints demonstrate a lack of equitable access and undermine the principle that all users should be able to navigate and enjoy the site without difficulty. These findings reflect broader concerns raised in prior research, which emphasizes that heritage sites, when not designed inclusively, may unintentionally exclude vulnerable populations (UNWTO, 2013; Irish, 2020). Thus, reconciling heritage preservation with inclusive design remains a critical concern.

### *Flexibility in Use*

The second principle highlights the need for designs that accommodate individual preferences and abilities. In Peneleh, this principle is only partially fulfilled. Positive examples include the availability of QR codes and printed brochures that offer manual and digital access to information. Several museum collections are accompanied by QR codes in Bahasa Indonesia and English, enhancing flexibility in information delivery. However, major limitations persist. There are no alternative mobility routes beyond standard footpaths, and the absence of accessible signage or dual-format information boards (visual and auditory) reduces usability for visitors with visual or cognitive impairments. In addition, urban circulation is frequently hindered by using both sides of the road for vehicle parking, causing congestion that limits flexible movement within the heritage area (Mahayani et al., 2022). The limited adaptability of infrastructure demonstrates the need for diversified solutions that can address multiple user needs simultaneously, a cornerstone of flexible and inclusive urban tourism (Goldsmith, 2007).

### *Simple and Intuitive Use*

This principle concerns the ease of use and user-friendliness of systems and environments, regardless of the user's experience or language proficiency. Peneleh Village demonstrates partial compliance. The online ticket reservation system provided by the Surabaya City Government is clear, accessible, and mobile-friendly. Tickets for key attractions—such as the Tjokroaminoto House and the Birth House of Bung Karno—can be purchased online or via QR code scanning on-site. This improves visitor planning and reduces operational burdens. Despite this, the spatial layout of the site and the availability of directional signage are insufficient. There is only one tourist map, located in an unstrategic area, and it is designed with a limited size and no English translation. Furthermore, most information boards are written exclusively in Bahasa Indonesia, limiting accessibility for international visitors. As prior studies note, intuitive design enhances user experience and reduces dependency on assistance, making it crucial for independently navigating historical environments (Müller, 2023).



**Figure 2. QR Code for Purchasing Museum Tickets at The House of H.O.S. Tjokroaminoto**

Source: Research Data, 2025

### *Perceptible Information*

Perceptible information ensures that necessary information is effectively communicated regardless of users' sensory abilities. At present, Peneleh Village lacks even the basic standards of this principle. There are no signboards with large fonts or high contrast colors, tactile elements such as Braille, and no audio support systems for visitors with visual impairments. Information dissemination has largely relied on oral explanations by members of Pokdarwis (the local tourism awareness group). However, these services are inaccessible for tourists who explore independently—especially foreign or visually impaired visitors. To compensate, students from Universitas Airlangga and Universitas Malang have collaborated with Pokdarwis to produce printed and digital brochures during community service programs (KKN). These solutions' temporary and volunteer-driven nature indicates a lack of institutionalized perceptible design planning. As accessibility scholars argue, relying

solely on human intermediaries without infrastructural support is not sustainable for inclusive tourism (Wan, 2024).

#### *Tolerance for Error*

The principle of tolerance for error aims to minimize the risks and adverse consequences of accidental or unintended actions within the built environment. In the context of heritage tourism, especially in sites that attract diverse visitor demographics, integrating safety features is vital to prevent injury and promote user confidence. Observational data from Peneleh Village reveal several infrastructural vulnerabilities. Several pedestrian pathways are in poor condition, lacking essential safety elements such as handrails on stairs or guardrails near elevation changes. Figure 4 illustrates a visible pothole in one of the main walkways, which poses a clear tripping hazard for all users—especially older people or those with limited mobility.



**Figure 4. A Pothole in Peneleh Area**

Source: Research Data, 2025

In addition, warning signs or hazard indicators are largely absent, even in areas with broken pavement or irregular elevation. The absence of visual or tactile alerts increases the likelihood of user errors and accidents, particularly in an environment where visitor attention is often divided between navigation and sightseeing. Basic security infrastructure is also limited. Although CCTV cameras have been installed at the H.O.S. Tjokroaminoto House, other key areas across the heritage village remain unmonitored. This creates potential vulnerabilities in terms of personal safety and property security. Some residents have responded by informally offering parking surveillance services for a fee, which reflects a community-driven workaround but lacks the institutional support or regulation expected in a tourism zone.

According to (UNWTO, 2013), ensuring visitor safety is not merely a technical issue but a component of a dignified and independent tourism experience. Inaccessible or unsafe environments effectively deter certain groups from participating and contradict inclusive design's core values. The findings from Peneleh demonstrate the urgency of adopting preventive safety measures, including surface repairs, hazard signage, and safety rails—all of which could significantly enhance the site's tolerance for user error.

#### *Low Physical Effort*

The sixth principle of Universal Design emphasizes that environments should be usable efficiently and comfortably with minimal physical effort. In tourism contexts—particularly in heritage areas with spatial complexity—this principle is essential to ensure that visitors of all ages and physical conditions can explore sites without excessive strain. In Peneleh Village, some positive elements reflect partial adherence to this principle. Several flat pathways and gently sloped entrances were observed, particularly in more frequently visited spots. Doors and gates are generally lightweight and easy to open, and some public toilets and prayer areas are located near main pedestrian paths, minimizing the need for long detours. However, these features are unevenly distributed across the site and lack consistency in their implementation.

The absence of seating or designated rest areas along main pedestrian routes is a major barrier, particularly in a site where tourist attractions are dispersed. Visitors must often walk considerable distances between the H.O.S. Tjokroaminoto House, Masjid Jami Peneleh, and the Dutch Cemetery. Currently, the only areas where tourists can rest are the Lodji Besar Café and Masjid Jami Peneleh—facilities not designed explicitly as resting points but used as such out of necessity. Furthermore, some pathways feature uneven, slippery, or damaged surfaces, which require more physical effort to navigate and increase fatigue among elderly visitors and those with mobility limitations. According to Farida, head of Pokdarwis, this issue has been frequently cited in visitor complaints. The lack of physical relief measures throughout the site reduces visitor satisfaction and limits repeat visitation—especially among vulnerable groups. These conditions reflect a failure to meet the principle of minimizing physical effort, which is vital to maintaining all users' comfort, independence, and dignity (Goldsmith, 2007). To address this, implementing rest benches every 50–100 meters, improved surface materials, and micro-mobility services such as shuttles could significantly reduce visitor strain and improve overall accessibility.

#### *Size and Space for Approach and Use*

The seventh principle of Universal Design emphasizes that physical environments should provide appropriate size and space for users to approach, reach, and use facilities—regardless of their body size, posture, mobility device, or assistance needs. This principle is crucial in ensuring that heritage spaces accommodate diverse visitors, including wheelchair users, older adults, families with strollers, and group travelers. In Peneleh Heritage Village, observations indicate that this principle remains largely unmet. Most pedestrian pathways are only wide enough for two individuals to pass side by side, and informal street vendors, parked vehicles, or physical barriers constrain the space between major attractions. Many access points—such as those at the House of H.O.S. Tjokroaminoto and Bung Karno's Birth House—lack ramps or wide entry doors, limiting access for wheelchair users or people with assistive devices.

Moreover, toilet facilities are significantly undersized and not adapted for users with disabilities. As shown in Figure 6, facilities at key attractions are narrow and lack adequate turning space or grab bars. Exhibition spaces within historical buildings also suffer from narrow corridors and tight viewing areas, making it difficult for groups or individuals with mobility aids to navigate comfortably. Parking infrastructure is another major limitation. The site lacks formal parking lots, and no specific areas are reserved for persons with disabilities. The absence of such fundamental features suggests that space planning in Peneleh has not yet accounted for inclusive design considerations. The observed conditions reinforce the critique that heritage preservation efforts, while well-intentioned, often neglect modern spatial requirements for accessibility (Bitušíková, 2021; UNWTO, 2013). Without meaningful interventions, spatial constraints will continue to exclude a significant portion of potential visitors, undermining the notion of inclusive cultural tourism.

The field observation conducted in Peneleh Heritage Village utilized 35 indicators derived from the seven principles of Universal Design. As shown in Table 1, only 22.86% of these indicators were fully met, while 11.43% were partially met, and the majority—65.71%—were not fulfilled. These findings reflect significant accessibility challenges concerning physical infrastructure, sensory information delivery, and spatial flexibility. The full breakdown of accessibility indicators is detailed below.

**Table 1. Accessibility Assessment of Peneleh Heritage Village Based on the 7 Principles of Universal Design**

Principle	Indicator	Observation Result
Equitable Use	Wheelchair-accessible toilet	Not Provided
	Sidewalks for wheelchair users	Not Provided
	Barrier-free entrance (no steep stairs)	Provided
	Information in both text and image	Provided
	Special treatment for specific groups	Not Provided
Flexibility in Use	Main and alternative routes (ramps/stairs)	Not Provided
	Toilet doors (manual or automatic)	Not Provided
	Facilities not dependent on only one mode of use	Not Provided
	Multi-language/symbol information boards	Partially Provided
	Access to info boards (manual + digital/QR code)	Provided
Simple & Intuitive Use	Clear and non-confusing directions	Not Provided
	Easy-to-navigate layout	Not Provided
	Readable & understandable information boards	Not Provided
	Simple reservation system	Provided
	Facilities are understandable without assistance.	Not Provided



Principle	Indicator	Observation Result
Perceptible Info	High contrast colors & large fonts	Not Provided
	Use of universal symbols	Not Provided
	Audio/tour guidance	Not Provided
	Braille signage	Not Provided
	Physical map available	Provided
Tolerance for Error	Paths with railings in risky areas	Not Provided
	Stairs with handrails	Not Provided
	No hazards (holes, broken paths)	Partially Provided
	Warning signs at danger points	Not Provided
	Active CCTV/security system	Partially Provided
Low Physical Effort	Flat paths or accessible ramps	Provided
	Rest areas/seating every 50–100 meters	Not Provided
	Non-slippery & safe surface conditions	Partially Provided
	Easy-to-open gates/doors	Provided
	Facilities/toilets near main paths	Provided
Size & Space for Use	Paths wide enough for two people to pass	Provided
	Toilets are spacious enough for wheelchairs.	Not Provided
	Exhibition/info areas are not narrow.	Not Provided
	Parking space with disabled access	Not Provided
	Wide entrances to buildings	Not Provided

Source: Research Data, 2025

### ***Policy Recommendations and Strategic Actions***

Based on the field observations and analysis of 35 indicators across the seven principles of Universal Design, Peneleh Heritage Village demonstrates only partial compliance. Of the total indicators, 11 were fulfilled (31.4%), three were partially fulfilled (8.6%), and 21 (60%) were not met. While some accessibility elements such as barrier-free entrances, physical maps, and easily accessible toilets near main paths are available, most essential features—particularly wheelchair-accessible toilets, safe walkways, seating areas, multilingual and multi-format information systems, as well as tactile or audio guidance—remain absent. To improve inclusivity and move toward full Universal Design compliance, the following strategic action areas are recommended:

1. **Infrastructure Upgrades:** a) Accessible Toilets: Where renovation of heritage buildings is not feasible due to conservation requirements, universally accessible toilet facilities should be installed nearby with clear directional signage; b) Sidewalk Improvements: Damaged and narrow sidewalks should be repaired and widened to accommodate mobility aids. Handrails must be installed along stairs to enhance safety; c) Parking Facilities: Develop a centralized, well-monitored parking facility for tourists, ideally equipped with CCTV and accessible paths leading to main attractions; d) Rest Areas: Install rest benches every 50–100 meters along tourism routes. These can be integrated with small-scale food and beverage stalls operated by locals, thus linking accessibility with community-based economic opportunities; e) Case Benchmarking: Peneleh can draw lessons from Kayutangan Heritage Village (Malang), where local community management has created inclusive and economically vibrant tourism infrastructure (Murtikasari & Tukiman, 2021).
2. **Information Accessibility:** a) Multilingual & Multi-format Communication: All major sites (e.g., Soekarno Museum, H.O.S. Tjokroaminoto House) should present information in at least two languages (Bahasa Indonesia and English), and in multiple formats including audio guides, Braille, and digital interfaces; b) Tour Guide Development: Local guides should receive training in foreign languages, especially English. While external interpreters offer translation services, they often lack cultural and historical depth—highlighting the need to build internal guide capacity; c) Signage and Mapping: Install large, legible, and visually clear maps in strategic locations across the village. These should indicate walking distances between attractions and feature universal icons and contrast-optimized layouts.
3. **Safety Measures:** a) Hazard Elimination: Sidewalks and pathways must be audited regularly for potential hazards. Clear warning signs should be placed in dangerous zones; b) CCTV Expansion: Security systems must be extended beyond museum entrances to include pedestrian routes and open spaces. This ensures visitor safety while supporting crime prevention and risk management.
4. **Stakeholder Collaboration:** The success of an inclusive heritage tourism transformation depends on multi-sectoral collaboration. The following stakeholders have key roles: a). Local Government: The Surabaya City Government should support heritage site accessibility through funding, policy instruments, and operational support. City-level coordination is also critical for establishing standards and evaluating



- progress; b) Academic Institutions: Universities can support capacity-building through: Language training programs (e.g., English for Tourism); Collaboration in developing inclusive tour content and guiding practices; Joint research initiatives to measure the impact of Universal Design implementation on local tourism; c) Private Sector & CSR: Corporations and local businesses can contribute via CSR programs—for instance, by: Funding infrastructure improvements (ramps, toilets, signage), Supporting shuttle bus services to connect dispersed attractions, and Providing inclusive tourism technology tools; d) Media Engagement: Traditional and digital media must be leveraged to raise awareness and promote inclusive tourism narratives. Social media campaigns, local storytelling, and influencer partnerships can enhance the visibility of Peneleh's unique cultural assets.
5. Toward Full Universal Design Compliance: Achieving full Universal Design integration in heritage tourism is not only a matter of physical modification—it requires a paradigm shift in planning, design, and governance. By aligning with international accessibility standards (UNWTO, 2013), engaging local communities, and institutionalizing inclusive practices, Peneleh Heritage Village can serve as a national benchmark for sustainable and inclusive heritage tourism.

## Discussion

The findings of this study reveal that Peneleh Heritage Village has only partially implemented the principles of Universal Design (UD), with only 31.4% of the assessed indicators being fully fulfilled. This reflects a significant disparity between the aspirational goals of inclusive tourism and the practical realities in historic urban settings, particularly in developing country contexts such as Indonesia. These findings resonate with earlier research by (Goldsmith, 2007; UNWTO, 2013), which emphasize that heritage tourism development often prioritizes conservation over accessibility—leading to structural exclusions that disproportionately affect vulnerable groups, such as persons with disabilities, older people, and international tourists unfamiliar with the local language and context. The absence of accessible toilets, rest areas, and multi-format information delivery systems reflects a persistent bias in spatial design, where the "average" user is assumed to be able-bodied, local, and fully literate.

Despite the challenges, partial implementation—such as online reservation systems, physical maps, and some QR-code-supported exhibits—demonstrates institutional awareness of the need for modernization and inclusion. However, the inconsistent application of UD principles across the village suggests a lack of holistic planning frameworks, where accessibility is considered an integrated design element rather than an afterthought or supplemental feature. One critical insight emerging from this study is the tension between heritage conservation and accessibility upgrades. As noted in the case of the H.O.S. Tjokroaminoto House, concerns about preserving historical authenticity have limited the installation of permanent ramps or accessible interior layouts. This reflects broader global debates on retrofitting historical environments without undermining their cultural value (Bitušíková, 2021). Context-sensitive solutions, such as portable ramps or externally located inclusive facilities, may offer balanced approaches that protect heritage while promoting equity.

The study also highlights the central role of local communities, particularly Pokdarwis (tourism awareness groups), in mediating the visitor experience. Without comprehensive municipal intervention, community-based initiatives—such as multilingual brochures developed with university partners—serve as essential accessibility enablers. However, these efforts are voluntary and temporary, and thus insufficient to sustain long-term transformation without institutional support. Moreover, the limited adoption of perceptible information design—such as Braille signage, audio guides, and tactile maps—illustrates a major gap between global standards and local practices. This deficiency limits the ability of the site to provide equitable cognitive access, a component often overlooked in physical accessibility assessments but essential for inclusive interpretation and meaningful visitor engagement (Müller, 2023).

Importantly, the spatial fragmentation of Peneleh—with dispersed attractions and the absence of safe, continuous pathways—compounds physical fatigue and navigation difficulty. This reinforces the call for integrated micro-mobility solutions, such as shuttle services or accessible path networks, to support low-effort travel between sites. From a policy standpoint, these findings underline the urgent need for multi-stakeholder collaboration. Without coordinated efforts from local government, academia, the private sector, and civil society, realizing inclusive, accessible heritage tourism will remain fragmented and under-resourced. In summary, the case of Peneleh reflects both the structural limitations and the transformative potential of Universal Design in heritage contexts. While physical barriers and planning gaps persist, the presence of motivated local actors and partial infrastructure offers a strong foundation for a more inclusive, resilient, and equitable tourism model.

## CONCLUSION

This study assessed the accessibility of Peneleh Heritage Village using the framework of Universal Design's seven principles, comprising 35 measurable indicators. The findings indicate that only 28.6% (10 indicators) were fully implemented, 11.4% (4 indicators) were partially fulfilled, and 60% (21 indicators) remain unmet. The most critical deficiencies were found in the principles of Equitable Use, Perceptible Information, and Tolerance for Error, particularly in the lack of wheelchair-accessible toilets, inclusive pathways, Braille signage, and safety measures such as handrails and warning signs. These gaps present significant barriers to inclusive and dignified tourism, especially for persons with disabilities, elderly visitors, and international tourists. Without immediate intervention, these conditions risk reinforcing spatial exclusion in a heritage site with considerable cultural and historical value.

To move toward full Universal Design compliance, a multi-pronged strategy is required. Priority actions include upgrading physical infrastructure (e.g., accessible toilets, rest areas, sidewalk repairs), enhancing information delivery through multilingual, tactile, and digital formats, and strengthening safety via surveillance systems and hazard mitigation. A target of achieving at least 80% accessibility compliance within the next 3–5 years is both measurable and attainable. Achieving this goal necessitates cross-sector collaboration. The local government must provide regulatory and financial support; academic institutions can contribute to capacity building and inclusive design research; the private sector can offer CSR-based investments in accessibility infrastructure; and community stakeholders must be empowered to retain cultural authenticity while improving visitor services. Finally, ongoing media engagement is essential to promote visibility and attract sustainable tourism. Through coordinated action, Peneleh has the potential to transform into a national model for inclusive heritage tourism, demonstrating that historical conservation and universal accessibility are not mutually exclusive, but mutually reinforcing.

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This study was conducted in compliance with research ethics for social science studies. Before data collection, permission was obtained from the head of the Pokdarwis (tourism awareness group) and the management of the House of H.O.S. Tjokroaminoto Museum to carry out field observations and interviews. All informants, including the Pokdarwis leader, museum staff, and local tourists, were provided with a clear explanation of the research objectives and their role in the study. All interviews were conducted with verbal informed consent, and we guaranteed that all information would be kept confidential and anonymous, with no personal identifiers used in the final report.

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