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INCLUSIVE HERITAGE TRAILS: ACCESSIBILITY CHALLENGES FOR VULNERABLE USERS IN KUALA LUMPUR'S URBAN CONSERVATION AREAS

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Abstract

Over the years, heritage trails within urban conservation areas have faced continuous threats as rapid development reshapes the surrounding landscape and alters the character of the city. These trails serve as vital pedestrian connectors and cultural storytellers, yet they remain physically inaccessible to vulnerable populations, including people with disabilities (PwD), the elderly, pregnant women, and families with young children. Therefore, the objective of this research is to identify the issues and challenges faced by vulnerable users and to examine the physical accessibility quality of heritage trails within Kuala Lumpur. Employing a qualitative case study research approach, data was collected using multiple sources of evidence. Semi-structured interviews were conducted with 11 vulnerable users, while participant observation involved 20 vulnerable users navigating the 2.57 km Kuala Lumpur Headquarters (KLHQ) Heritage Trail. Thematic analysis conducted via ATLAS.ti extracted 68 key phrases, which were synthesized into five core planning-relevant attributes: connectivity, usability, safety, information availability, and policy compliance. Findings reveal that the historic trail network fails to provide continuous accessibility. Therefore, this research proposes a comprehensive strategy based on universal design principles in creating inclusive heritage trails that inform the stakeholders and decision makers, directly advancing Sustainable Development Goal (SDG) 3 and 11.

Keywords: Inclusivity, universal design, heritage trail, vulnerable users, person with disability

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INTRODUCTION

Malaysia possesses a rich historic built environment, particularly in urban centres like Kuala Lumpur (KL), which holds over 500 historic landmarks reflecting its cultural identity. Heritage trails interconnect these historic buildings, spaces, and cultural elements, providing substantial social, educational, and economic benefits through heritage tourism. However, vulnerable users are frequently marginalized due to limited physical access and environmental barriers. The vulnerable group extends beyond PwDs to include individuals experiencing temporary disabilities, the elderly, pregnant women, and families with young children.

In Malaysia, heritage tourism is vital for the domestic economy. In 2019, domestic tourism was valued at approximately USD 23.4 billion (RM103.2 billion) (Department of Statistics Malaysia, 2020). However, despite the economic potential, previous studies indicate that vulnerable users are marginalized from historic spaces due to social and physical barriers. This exclusion directly contradicts the 11th Sustainable Development Goal (SDG), which mandates safe, inclusive, and accessible public spaces for all.

The research gap addressed in this study is the lack of qualitative evidence regarding the real experience of vulnerable users, specifically within heritage trails, rather than static buildings. While existing literature provides quantitative data on physical defects, there is insufficient understanding on how these groups navigate, perceive, and cope with the urban heritage trails.

A significant challenge in creating inclusive heritage trails lies in the conflict between Universal Design principles; which require physical alterations for accessibility and current conservation practices that prioritize strict originality and authenticity. This is further exacerbated by the unintegrated roles of stakeholders and unclear planning regulations regarding heritage trail jurisdictions. This research aims to recommend strategies for improving accessibility to create inclusive heritage trails within urban conservation areas for vulnerable users. The objective of this paper is; (i) to identify the issues and challenges faced by vulnerable users and (ii) to examine the physical accessibility quality of heritage trails within Kuala Lumpur. The outcome of this paper is a recommendation of strategy in improving accessibility to create inclusive heritage trails within urban conservation areas for vulnerable users.

LITERATURE REVIEW

Sustainable Heritage and the Social Model of Disability

Urban conservation areas preserve the tangible and intangible cultural identity of a city, with heritage trails serving as the vital links that interconnect these historic sites. Achieving sustainable heritage conservation requires not only preserving these physical assets but also ensuring they provide equitable social and cultural

value to the entire community, aligning with Sustainable Development Goal (SDG) 11 for inclusive cities (UNESCO, 2026). The Social Model of Disability highlights that individuals are marginalized primarily by disabling environmental barriers rather than their own individual physical limitations (Kamarudin et al., 2022). In this context, the targeted vulnerable demographic extends beyond registered Persons with Disabilities (PwDs) to include the aging population, pregnant women, families with young children, and individuals with temporary impairments.

Historic Urban Environments in Malaysia

The historic urban environment encompasses not just buildings and monuments, but the broader urban fabric that reflects a society's cultural evolution. The identity of urban environment is formed by historical fabric, historic places and buildings as they are part of the culture, education, and tourism of the world (UNESCO World Heritage Centre, 2025). In Malaysia, this environment is pivotal to national identity, with cities gazetted as World Heritage Sites like Melaka and Georgetown. Other cities such as Kuala Lumpur, Kuala Kangsar, Kota Kinabalu and Kota Bharu also known for their rich cultural and historical traits among the locals and international visitors and act as the custodians of architectural history (Che Ghani et al, 2024). Under the Warisan KL initiative, over 500 historic icons have been identified in downtown Kuala Lumpur (Kuala Lumpur City Hall, Think City, 2024). However, managing this environment requires a delicate balance between preservation and the evolving needs of a modern, inclusive society. The challenge lies in maintaining the outstanding value of these sites while ensuring they remain functional for the living community.

Universal Design in Historic Built Environments

To dismantle these external barriers, the integration of Universal Design (UD) principles is critical, as UD ensures that spaces are usable by diverse groups with minimal physical effort and without specialized adaptations. For heritage trails, accessibility is fundamentally defined by four physical attributes: connectivity (continuous pathways, accessible public transport, and ramps), usability (available resting areas and family-friendly amenities), safety (hazard-free and well-lit environments), and information availability (clear wayfinding and assistive technologies) (Yakob et al., 2022). However, implementing these attributes frequently triggers a fundamental conflict between UD requirements, which necessitate physical modifications and traditional heritage conservation paradigms that prioritize strict authenticity and minimal intervention.

Recent literatures have transitioned from a static, building-centric conservation paradigm toward a dynamic 'living heritage' approach that

prioritizes active community engagement and equitable spatial access. Pawłowska et al., (2023) highlighted that physical accessibility is a core indicator of a 'friendly city' and directly determines the social sustainability of architectural heritage. However, integrating accessibility features within historic fabrics often triggers acute preservation conflict. As discussed by Althabhwawi & Al-Khafaji, (2025) and Dipasquale et al., (2022), traditional conservation frameworks place immense emphasis on physical 'authenticity' and minimal intervention, which local authority frequently interpret as a blanket restriction against retrofitting additional physical elements. In the Malaysian planning context, this conflict manifests as a severe policy implementation gap where the Uniform Building By-Laws (UBBL) and Malaysian Standard MS1184:2014 mandate universal access, yet their statutory jurisdiction is heavily restricted when applied to buildings and sites governed by the National Heritage Act 2005. This policy friction creates a fragmented outdoor public realm where individual heritage buildings may be retrofitted internally, but the pedestrian networks connecting them remain highly inaccessible.

Legislation and Policy Frameworks

The successful integration of accessibility into heritage areas relies heavily on legislative frameworks. In Malaysia, key governing policies include the National Heritage Act 2005 (Act 645), the Persons with Disabilities Act 2008 (Act 685), and the Malaysian Standard (MS1184:2014) Universal design and accessibility in the built environment - Code of practice (Second revision) (Department of Standards Malaysia, 2014; Persons with Disabilities Act 2008, 2018; National Heritage Act 2005, 2006). Despite these foundational acts, literatures indicated that Malaysia struggles with unclear bureaucratic jurisdictions and a lack of integrated guidelines that specifically bridge heritage conservation with universal design (Kamarudin et al., 2022; Zahari et al., 2016). Unlike several developed nations that offer targeted funding and explicit guidelines for retrofitting historic buildings, current local practices often overlook the external environments and trails connecting these sites, leaving vulnerable users to navigate inaccessible public spaces (Abd Ghafar et al, 2022).

Developed countries worldwide have progressively and comprehensively integrated Universal Design into urban conservation areas, ensuring that heritage environments are accessible, inclusive, and responsive to diverse user needs. Numerous policy frameworks and guidelines have been established to support the implementation of universal design within heritage conservation contexts (Marsin et al., 2014). In contrast, the adoption and integration of such initiatives in Malaysia remain comparatively limited and less systematically embedded. A comparative overview of universal design policies

and practices between developed countries and Malaysia is presented in Table 1 below, highlighting key gaps and opportunities for improvement.

Table 1: Comparison of Heritage and Universal Design Initiatives in Malaysia and Selected Developed Countries

Country	Heritage Acts & Guidelines	Universal Design Act & Guidelines	Universal Design Guidelines for Built Heritage
Malaysia	National Heritage Act 2005 (Act 645) Guidelines of Heritage Building Conservation 2017 Planning Guidelines for the Conservation of Heritage Areas and Buildings 2023 (PeWARIS)	Persons with Disabilities Act 2008 (Act 685) Malaysian Standard: Universal design and accessibility in the built environment-Code of practice (MS1184:2014) Universal Design Guidelines for the Built Environment	Not Available
Singapore	Preservation of Monuments Act 1971 Urban Redevelopment Authority Act 1989	Code on Accessibility in the Built Environment 2019 (BCA) Universal Design Mark Certification	Accessibility Fund
Ireland	Heritage Act 1995	Building for Everyone: A Universal Design Approach (National Disability Authority)	National Disability Authority's heritage guidance documents*
Australia	Australian Heritage Council Act 2003	Disability Discrimination Act 1993	Improving Access to Heritage Buildings 1999

Source: (Marsin et al., 2014) and author's compilation (2025)

RESEARCH METHODOLOGY

This study adopted a qualitative cross-sectional design using a case study approach with two units of analysis: the vulnerable users and the physical built environment of a selected heritage trail within an urban conservation area. Data collection involved multiple sources of evidence, specifically semi-structured interviews and participant observation. First, semi-structured online interviews were conducted with 11 vulnerable users who had prior experience visiting or working near the selected heritage sites. This approach was selected to capture the lived experiences of vulnerable users, which quantitative surveys often overlook. The participants were recruited through snowball sampling, representing a cross-section of vulnerabilities. The participants categories were further detailed in Table 2.

Table 2: Categories of interview participants

Interview Participants (experienced users)		
Pseudonym	Age range	Vulnerable user category
NS	mid 30s	Parents with young children
UW	late 30s	
SH	mid 30s	
HL	early 40s	
SY	late 30s	Visual impaired-wheelchair user
WN	early 40s	Caregiver to wheelchair user (elderly)
AL	late 30s	
AZ	early 40s	Pregnant women
CC	late 60s	Elderly
AM	mid 30s	Person with temporary disability
MS	early 40s	Person with walking disability
Total		11 participants

Source: (Author, 2025)

The interview sessions were conducted online, in Malay (Bahasa Malaysia), until a saturation point was reached, where no new themes emerged. The sessions were later transcribed and translated using back-translation to ensure accuracy. The contents of the sessions were also referred back to the respondents during the analysis process in order to eliminate bias. The data collected were analyzed using ATLAS.ti, where 68 key phrases were axially coded into five main themes.

Second, to validate the findings from the semi-structured interviews, an on-site participant observation was conducted involving 20 first-time vulnerable users visiting the selected site of KLHQ Heritage Trail. According to Denscombe (2010), the participant observation method is beneficial as the researcher is directly involved in the field, enabling data collection in real-life situations and within the participants' natural setting. However, Cassell & Symon (2004) argued that participant observation may involve perception of the users and the observation findings can result in personal preferences. Therefore, in this research, the researcher adopted the participant-as-observer identity as suggested by Waddington (2004) to participate in the observation session in order to clarify any issues or personal perception of the participants to minimize biasness. The researcher also clearly explained her role and purpose during a briefing session prior to the site visit to ensure transparency and informed participation.

Table 3: Categories of observation participants

Observation Participants (first time visitor to selected site of case study)		
Pseudonym	Age range	Impairment category
P1	31	Physical disability
P2	32	Visual impairment

P3	45	Physical disability
P4	31	Visual impairment
P5	34	Visual impairment
P6	25	Physical disability
P7	27	Visual impairment
P8	33	Visual impairment
P9	38	Physical disability
P10	31	Physical disability
P11	35	Visual impairment
P12	27	Physical disability
P13	34	Physical disability
P14	35	Physical disability
P15	35	Physical disability
P16	39	Physical disability
P17	40	Physical disability
P18	59	Visual impairment
P19	30	Physical disability
P20	33	Physical disability

Source: (Author, 2025)

Case Study Selection: KLHQ Heritage Trail

The Kuala Lumpur Headquarters (KLHQ) Heritage Trail was selected as the focal unit of analysis due to its unique status as the cultural and administrative birthplace of modern Kuala Lumpur. This is the most prominent trail, as it features a variety of significant heritage buildings along the route. Spanning a continuous 2.57 km loop through the gazetted historic core of downtown Kuala Lumpur, the trail encompasses 16 key heritage checkpoints, including Dataran Merdeka (Independent Square), the Sultan Abdul Samad Building, Jamek Mosque, and the Old General Post Office. This site represents a classic urban planning challenge which are protected under the National Heritage Act 2005 (Act 645). The buildings within and around the KLHQ Heritage Trail are featured as unique experiences in various official tourism websites as the Kuala Lumpur Tourism Bureau and Jabatan Wilayah Persekutuan (JWP) (Jabatan Wilayah Persekutuan, 2025). Concurrently, the trail serves as an active commercial and transit corridor with high daily pedestrian foot traffic, managed by the Kuala Lumpur City Hall (DBKL) and promoted globally for heritage tourism. Consequently, the KLHQ trail also acts as a highly representative micro-model for other post-colonial, high-density historic cities across Southeast Asia struggling to balance strict conservation guidelines with modern accessibility standards.

To systematically evaluate the on-site accessibility quality, the Heritage Trail Accessibility Checklist (HTAC) was developed as an audit instrument. The HTAC was constructed by adopting the statutory specifications detailed in the MS1184:2014 and the standard universal design checklist developed by

Department of Local Authority (JKT) into an observable, site appropriate audit format. To ensure validity, the draft checklist was evaluated by two universal design experts from Public Works Department (JKR) and one heritage conservator of National Heritage Department (JWN). The HTAC was tested prior to the observation session at the selected site by the author to further refine the items listed. During the observation session, the researcher acted as a 'participant-as-observer' capacity to minimize researcher bias and ensure participant comfort, while utilizing the HTAC to systematically document spatial dimensions (e.g., curb heights, ramp angles, path widths) and compliance status across the 16 checkpoints. The route map for Kuala Lumpur Heritage Trail KLHQ is depicted in Figure 1.



Figure 1: Route Map of Kuala Lumpur KLHQ
Source: (Dewan Bandaraya Kuala Lumpur, 2018)

ANALYSIS AND DISCUSSION

Findings on Semi-Structured Interviews

The thematic analysis of the interviews generated 68 key phrases concerning accessibility, which were categorized into five core themes: connectivity, usability, safety, information availability, and policy implementation. The interview analysis revealed interconnected and systemic accessibility issues as detailed below.

Connectivity (most critical)

Connectivity was identified as the most critical issue, with almost all respondents detailing severe challenges with pathway conditions. The findings revealed uneven surfaces, broken tactile walking surface indicators (TWSI), and discontinuous pathways. Vulnerable users frequently had to share routes with active motor vehicle traffic due to high curbs, missing pedestrian crossings, and the absence of dedicated pedestrian lanes, causing immense danger. The respondents were quoted as:

“They (pathway) were done halfway through, portion by portion. There is no continuity.” (AL: Caregiver to wheelchair user)

“Not all users are familiar with the location, even I’ve stumbled here and there (due to the uneven surfaces)” (AZ: Pregnant women)

“But the pathways near BSAS are quite rocky. Therefore, we had to be careful to avoid tripping over while walking (around the area).” (AM: Person with temporary disability)

Usability (critical)

Usability challenges encompassed an overall lack of public amenities and family-friendly facilities, such as accessible public toilets and nursing rooms. Furthermore, respondents highlighted discomfort due to unpredictable weather, uncovered walkways, and the absence of shaded resting areas or seating along the lengthy trails. The lack of permanent food and beverage facilities nearby also impacted user experience.

“The buildings were nice, beautiful, yet the facilities for public were not available, such as toilets, shaded areas.” (HL: Parents with small children)

“The area has some seating, but they are in the open (not properly covered). The seating was only shaded by big trees (and surrounding buildings).” (AL: Caregiver to wheelchair user).

Safety (critical)

Safety features were severely lacking. Respondents reported feeling unsafe navigating poorly maintained, dimly lit pathways and underground parking structures. Additionally, public seating intended for tourists was often occupied by homeless individuals, deterring vulnerable users.

“I don’t feel safe to be around that area. No, I tried not to (go back home late at night). It was scarier at night. The police were not around much too.”

Hmm, it was quite risky (to use the route). Well, the route is unsafe. Lack of safety features.” (CC: Elderly)

“Lack of maintenance will cause obstacles and people will avoid routes that are not well maintained, as these issues will create safety problems.” (AL: Caregiver to wheelchair user).

Information Availability

Wayfinding across the KLHQ trail was heavily criticized. Participants reported ineffective and poorly positioned signages, making independent navigation nearly impossible for first-time visitors or visually impaired individuals. The absence of on-site information centres and accessible write-ups regarding the heritage buildings compounded this issue.

“Currently the route was quite unwelcoming (confusing), as visitors don’t even know they can access the courtyard and stroll along the ground floor of BSAS. The wayfinding system was off too.” (HL: Parents with small children);

“The stairs in BSAS are also quite confusing and their location are hidden, hard to find and navigate. The stairs are not visible. Only frequent users will be able to locate the stairs, other than the grand staircases at the front of the building.” (AL: Caregiver to wheelchair user).

Legislation and Policy

Respondents emphasized that bureaucratic restrictions under the National Heritage Act limit necessary physical alterations. A general lack of enforcement regarding Universal Design integration in heritage locations and limited budget allocations were also cited as primary barriers.

“So, when we want to repair or renovate a particular warisan (heritage) building, it really depends on the act (National Heritage Act 2005). Therefore, it causes us to be restricted in a lot of things related to the act, we could not change it. Because the route itself is considered as part of the building’s area, isn’t it? So maybe we could not change it, I’m not sure.” (AM: Person with temporary disability)

“The current amendment of UBBL to adhere to MS1184 were published in 2021, so the awareness of this were not adamant yet. for older buildings, there are many steps for us to take to touch, renovate or amend the buildings, as we need to adhere to Act 645 National Heritage Act, or some

restrictive jurisdiction from the local authority.” (HL: Parents with small children)

Findings on the Participant Observation

The site observations robustly validated the interview findings and further revealed five key thematic issues: connectivity, usability, safety, information, and policy compliance. In terms of connectivity, several segments of the heritage trail were found to be physically discontinuous. For example, at Check Point 4 (Old General Post Office), the presence of mobile road barriers and steel poles fragmented pedestrian movement and disrupted the logical flow between heritage nodes. This discontinuity forced wheelchair, stroller and visually impaired users to divert onto main vehicular roads, significantly reducing walkability and network cohesion along the trail. They were diverted onto the active, multi-lane vehicular road, exposing them to direct collision risks.

Regarding usability, the pathway design was found to be poorly adapted for diverse user needs. At Check Point 6 (Independent Square), the obstruction of pedestrian crossings with multiple traffic lanes created confusion and difficulty in navigation, particularly for older persons and users with mobility limitations. The presence of street furniture placed without consideration of pedestrian desire lines further reduced overall spatial usability.

From a safety perspective, critical hazards were identified along key segments. Steel poles installed directly within tactile paving at Check Point 5 (Sultan Abdul Samad Building) and Check Point 7 (along Jalan Raja) posed serious risks for visually impaired users, undermining the function of accessibility aids and increasing the likelihood of collision or misdirection. The lack of segregation between pedestrian and vehicular movement further heightened risk exposure.

In relation to information, Check Point 15 (Masjid Jamek area) demonstrated a clear deficiency in wayfinding and interpretive signage. First-time visitors of elderlies, wheelchair and visually disabled users, were observed navigating the area without adequate guidance, resulting in uncertainty, hesitation, and inefficient movement patterns. The absence of clear and inclusive information systems significantly reduced the legibility of the heritage environment. Elderly and pregnant women are most vulnerable to environmental discomfort and a lack of resting infrastructure. The 2.57 km trail has long segments without any shade, benches, or public restrooms available to be used by the users.

Finally, policy compliance issues were evident across multiple checkpoints. The misalignment between on-ground conditions and established accessibility and urban design guidelines suggests gaps in the enforcement and implementation of inclusive urban policies. Visually impaired participants faced

many obstacles, such as steel poles installed directly in the middle of tactile paving, shown in Check Point 7 as non-compliance with the MS1184:2014. The inconsistent provision of barrier-free infrastructure indicates that existing standards are not fully integrated into site-level planning and management practices. These findings are summarised in Figure 2 and Table 4, illustrating the interrelated nature of these five themes in shaping the accessibility experience of vulnerable users along the heritage trail.



Figure 2: Accessibility findings during participant observation
Source: (Authors, 2025)

Table 4: Accessibility Themes, Key Challenges and Priority Action Level

Theme	Key Challenges	Priority Action Level
Connectivity	Uneven surfaces; shared paths with vehicles; unusable/obstructed TWSI; steep ramps; inaccessible sidewalks due to high curbs.	Priority 1: Immediate Safety Hazards (Urgent Intervention)
Usability	Lack of family-friendly facilities; inaccessible toilets; uncovered rest areas; lack of maintenance.	Priority 2: Mid-Term Usability & Path Adjustments
Safety	Poorly lit paths and parking; homeless people occupying public seating; broken tiles and uneven pathway.	Priority 1: Immediate Safety Hazards (Urgent Intervention)
Information Availability	Unclear wayfinding; limited/ineffective signage; unavailable on-site heritage information.	Priority 3: Long-Term Information & Amenity Gaps
Policy Compliance	Lack of enforcement for universal design and MS1184:2014; bureaucratic limits on heritage alteration.	Priority 3: Long-Term Planning and Strategic Coordination

Source: (Author's, 2025)

DISCUSSION

Accessibility to heritage trails is vastly impacted by connectivity, usability, safety, information and policy. The concept of "human-centred design" shall be adapted in the built environment to improve access to people of all ability (Myerson, 2007). This can be done by identifying elements that need to be improved (Australia ICOMOS. & International Council on Monuments and Sites., 2000;) National Heritage Act 2005, 2006) (Department of National Heritage, 2017). The integration of Universal Design within historic built environments is paramount for achieving sustainable heritage tourism. As demonstrated by the findings, the current accessibility quality of the KLHQ Heritage Trail fails to meet the fundamental standards required by the Social Model of Disability, leaving vulnerable users marginalized by disabling environmental designs rather than individual limitations.

Therefore, it is crucial for all stakeholders to take actions according to their jurisdiction. The proposed stakeholders' responsibility matrix is shown below in Table 5.

Table 5: Stakeholder's responsibility matrix

Stakeholder Agency	Jurisdiction	Proposed Action
Dewan Bandaraya Kuala Lumpur (DBKL)	Public rights-of-way, pedestrian pathway maintenance, street furniture, crossing signals, and UBBL enforcement	Immediate removal of steel poles blocking tactile paving. Levelling uneven paving stones. Extending pedestrian crossing times at CP6.

Stakeholder Agency	Jurisdiction	Proposed Action
Jabatan Warisan Negara (JWN)	Statutory oversight of gazetted heritage sites and conservation guidelines under Act 645	Drafting a 'Heritage Universal Design Guideline'. Fast-tracking approvals for essential installation of universal design elements.
Tourism Agencies (e.g., JWP, KL Tourism Bureau)	Tourism marketing, trail curation, visitor distribution, and public awareness campaigns	Developing inclusive tactile and audio trail maps. Incorporating accessibility ratings on official tourism portals.
Heritage Building Owners	Internal facility management, building entrances, universal restrooms, and step-free lobby access	Retrofitting entrance steps with compliant, reversible ramps. Ensuring constant maintenance of universal toilets.
Infrastructure & Transit Providers	Public transit interfaces, LRT/MRT stations, and designated PwD parking spaces	Repairing broken elevators connecting parking to trail levels. Enforcing strict towing of non-PwD vehicles in PwD bays

Source: (Author's, 2025)

Resolving the tension between the National Heritage Act 2005 (which preserves historic fabric) and the PwD Act 2008 (which mandates accessibility) requires a paradigm shift from rigid physical modification to reversible, sympathetic universal design solutions. Achieving inclusive heritage trails requires stakeholders to systematically address all elements in the five identified attributes. First, connectivity must be resolved by prioritizing continuous, level, and dedicated pedestrian pathways over vehicular infrastructure. To preserve the original historical paving and structural facades, the use of modular, lightweight, and reversible composite ramps that sit on top of historic building fabrics shall be considered. Second, guidelines must dictate the sympathetic installation of modern accessibility features such as integrated 3D-tactile maps for wayfinding, shaded rest stops, and accessible ramps without stripping the authenticity of the cultural heritage (Lutfi A Rahaman; Nabilah Naharudin, 2024). This includes the deployment of low-energy technology and QR codes that stream real-time audio navigation and digital wayfinding directly to users' smartphones, ensuring inclusion while preserving strict heritage authenticity. Finally, legislative frameworks, such as the National Heritage Act 2005 and the Persons with Disabilities Act 2008, must be better harmonized to enforce Universal Design compliance as a mandatory, rather than voluntary, requirement in conservation management plans.

CONCLUSION

In conclusion, this research demonstrates that heritage trails within Kuala Lumpur's urban conservation areas remain largely inaccessible to vulnerable communities due to severe physical and systemic barriers. The conflicting priorities between preserving historical authenticity and implementing Universal Design (UD) principles have consistently marginalized users, ranging from people with disabilities to the elderly, pregnant women, and families with young children. Achieving truly inclusive heritage trails requires concerted, integrated action from all stakeholders. This means moving beyond fragmented bureaucratic roles to effectively harmonize legislation. By mandating these accessibility policies and fully adopting standards like MS1184:2014 in conservation guidelines, local authorities can provide barrier-free environments without compromising intrinsic cultural values. Ultimately, a human-centered urban design approach aligns directly with Sustainable Development Goal (SDG) 11, fostering equitable access, social inclusion, and sustainable community-based heritage tourism. Moving forward, future research must focus on formulating a detailed, standardized framework based on these five attributes to comprehensively guide local authorities and policymakers in managing and retrofitting heritage trails across Malaysia.

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DISCLOSURE STATEMENT

The authors declare no competing interests.

This research has been approved for its application of research ethics clearance by Universiti Malaya Research Ethics Committee (UMREC) in accordance with the Universiti Malaya Research Ethics Guidelines with reference number of UM.TNC2/UMREC_2597.

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