

Accessibility as a Heritage Fruibility Itinerary



Antonio Acierno and Alessandra Pagliano

Abstract This essay explores accessibility as a fundamental design strategy for heritage fruition and valorisation. The study investigates how creating inclusive itineraries—encompassing physical, sensory, and digital dimensions—can transform cultural assets into accessible public resources, broadening the user base and increasing collective engagement. By viewing accessibility as a regenerative and integrative process, the chapter offers operational guidelines that enhance social equity and enrich the experience of cultural landscapes, moving from passive conservation to active, shared stewardship.

Keywords Accessibility · Cultural landscape · Walkability

Accessibility to the Cultural Landscape as a New Paradigm of Protection

The contemporary debate regarding the protection and enhancement of heritage has undergone a significant evolution, shifting focus from the isolated architectural object to the cultural landscape, understood as a fundamental resource for human development and quality of life. This paradigm shift finds its highest expression in the UNESCO Recommendation on the Historic Urban Landscape (HUL) (United Nations Educational, Scientific and Cultural Organization 2011). According to this approach, the historic landscape is not a collection of static monuments but a stratified system of natural and cultural values, both tangible and intangible, encompassing social practices, perceptions, and the use of space by communities. In this scenario, accessibility can no longer be understood as a mere technical-regulatory requirement linked to the removal of physical barriers, but as an essential condition of democracy and citizenship. The cultural landscape, viewed through the lens of the HUL, is a complex organism where historical stratifications, symbolic values, and

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physical morphologies coexist. Rendering it accessible thus implies performing a “re-stitching” between the territory and its inhabitants, overcoming limits that are not only spatial but also sensory, cognitive, and social. Furthermore, the landscape connects the processes of territorial identity construction with experiences of spatial enjoyment. Depending on how the landscape is structured, it can catalyse infinite forms of experience, amplifying its appeal to users in relation to the scale of the area, its geographical location, and its historical and cultural qualities. These factors can determine the centrality of a specific landscape within the social framework, based on its aesthetic and cultural values, its inner symbolic character, and the experiences it can offer to the community that utilizes it. It is well known how strongly social and cultural factors can influence the collective imagination, thereby defining ordinary or tourist practices that are heterogeneous in terms of purpose and modalities (Terkenli et al. 2021).

A consistent body of research has problematized how landscapes are experienced, represented, and governed. Urban and landscape studies have foregrounded the phenomenology of place, emphasizing attachment, identity, and the experienced meanings of outdoor spaces (Relph 1976). Moreover, cultural-historical perspectives have reframed the landscape as a symbolic and ideological construct rather than a neutral backdrop, showing how visions of nature are historically produced and politically characterized (Cosgrove 1984). In parallel, critical urban theory has underscored the social production of space, insisting that spatial practices and representations are co-constituted through power, everyday routines, and infrastructures. In this context, the current digital transition further redefines the characters and tools of both participation and visual-perceptive interpretation. Studies on smart tourism ecosystems and media suggest that specific databases, augmented reality (AR), virtual reality (VR), and mobile interfaces hybridize physical and mediated dimensions, reconfiguring place attachment and learning outcomes (Farman 2012). Narrative cartography extends this concept by showing how story maps and geospatial narration can connect daily mobility policies with multiscale readings of the territory (Caquard and Cartwright 2014).

In any case, it is important to consider the evolution of landscape enjoyment modalities due to the increasing digitalization of the tourist experience, which has introduced new ways of accessing and representing the territory. Immersive technologies such as VR and AR, geo-storytelling tools, and interactive platforms are gradually changing the experience of visiting places, integrating direct enjoyment with other modes of interaction with the landscape that are parallel to, and sometimes even substitute for, physical presence.

The Multidimensional Overcoming of Physical and Cognitive Barriers

The primary limitation of traditional territorial studies has been addressing accessibility with an additive approach. Conversely, an inclusive landscape project must integrate the overcoming of barriers from the initial design phase, moving from the territorial scale to the detail level. Barriers manifest in various forms: physical, due to elevation changes or inconsistent paving; cognitive, when orientation systems and understanding of the historical palimpsest are lacking; and social, when heritage is perceived as alien or reserved for a cultural elite. Physical barriers are the most evident, especially in orographically complex contexts or archaeological sites; however, the landscape offers the opportunity to transform constraints into resources. The design of constant-gradient paths, the use of natural materials that signal direction chromatically or tactilely, and the care of walkable surfaces are just some elements of a universal accessibility design. This opens up the full bodily and visual experience of space, allowing for real knowledge and co-design of the cultural landscape. Full sensory accessibility extends this concept as the landscape should be heard and touched, in addition to being visually enjoyed. For example, the inclusion of olfactory gardens or the enhancement of the soundscape allows for a deep enjoyment even for individuals with visual or hearing impairments.

Often the strongest barrier consists of the inability to understand the surrounding context: a cultural landscape is mute if it is not adequately narrated. Cognitive accessibility concerns the user's ability to orient themselves and decode the historical palimpsest of the place, also in respect of the theory of space legibility (Lynch 1960). A landscape is accessible if the user can construct a coherent mental map of it; for this purpose, tools such as wayfinding are used, which do not only concern signage but also the use of environmental cues like material paving, lighting, and clear sightlines to orient the visitor. Furthermore, perceptive barriers are linked to feelings of non-belonging or insecurity: a poorly lit, degraded place lacking comfortable rest areas is, in fact, inaccessible, as it repels the user rather than welcoming them. Resolving this involves the techniques of safe space design (Newman 1972; Acierio 2003, 2025).

Finally, the landscape is a common good, but gentrification processes or excessive "museumification" often make it elitist and the prerogative of few social classes or groups of adequately educated subjects. Designing for social accessibility must question who inhabits and uses the landscape, providing open spaces for public use and functions that respond to the needs of the local community, preventing heritage from becoming a theme park solely for tourists. Lastly, cultural accessibility aims to translate complex content into inclusive languages, making the history of the place accessible across different levels of education, background, and sensory or cognitive ability. To broaden social and cultural accessibility, it is necessary to activate co-design approaches involving "heritage communities," as defined by the Faro Convention.

The following paragraphs briefly describe the experiences-distinct yet converging in methodological premises and operational goals-developed by the authors: the first relates to the development and testing of a cognitive methodology co-designed with the accessibility community, predominantly physical-perceptive and based on walkability and the experiential transect, in the Phlegraean Fields study area; the second describes the co-design of an inclusive physical-sensory path, particularly attentive to the needs of subjects with psycho-cognitive limitations, developed in the same study area. Both experiences made extensive use of digital technologies, from GIS to AR and VR, as well as Digital Storytelling, the latter constituting the complete repository of the activities carried out. For an exhaustive description of the experiences, reference is made to the two digital storytelling projects produced (Fig. 1), the first named *Perceiving isolation to mend the Phlegraean Fields. Experiential transects for enjoying the Phlegraean landscape* (*Percepire l'isolamento per ricucire i Campi Flegrei. Transetti esperienziali per la fruizione del paesaggio flegreo*) edited by Acierno and Pistone, and the second *Images and Imaginary of the Phlegraean Fields. Thematic itineraries for learning about and appreciating the Phlegraean landscape* (*Immagini e immaginario dei Campi Flegrei. Percorsi tematici per la conoscenza e valorizzazione del paesaggio flegreo*) edited by Attademo and Pagliano (2024).

Walkability and the Experiential Transect as Cognitive Tools

It is worth emphasizing how much the configuration of the territory influences the way space is used, recalling the possibility of studying the landscape through a visual approach based on direct experience of places. Landscape areas are indeed a translation of individual perceptions, becoming common goods that condense shared meanings when they are participated in by the community.

In line with these premises, the concept of walkability has become central to urban planning and sustainable mobility. The theory indicates the degree of ease with which a place can be reached on foot, with positive impacts on mental and physical health (Wang and Yang 2019; Speck 2013), and the concept of walkability actually measures the capacity of a given place to support the use of space through physical exploration, establishing a direct perceptive relationship with landscape assets. This relationship is consolidated through in situ actions and social interaction, constituting dynamic interpretative tools for the user. In other words, walkability can describe the extent to which an area supports soft mobility, promoting an equitable relationship between distances, times, and accessibility, thereby enhancing landscape quality. The aesthetic and functional characteristics of physical space influence the sense of comfort and safety, encouraging place attachment and the propensity for pedestrian exploration through landmarks within slow routes. Walking is a multi-sensory tool for spatial understanding, useful for identifying the specific criticalities of places (Urrutia-Reyes et al. 2025). Walkability encodes an experiential mode of



Percepire l'isolamento
per ricucire i Campi
Flegrei



Immagini e Immaginario
dei Campi Flegrei

Fig. 1 QR-codes for StoryMaps digital storytellings

movement that reconstructs interaction with the landscape, quantifying the degree of accessibility to shared knowledge.

In compact historic urban contexts, morphology is often favourable to walkability, but one must account for criticalities such as physical conformation and anthropogenic pressure that reduces pedestrian spaces in favour of vehicular mobility. The experience of walking allows for the grasping of the complexity of material and immaterial values, combining the user's cognitive perception with real space and geographic narrative. This leads to the necessity of recognizing walkability as a fundamental epistemic dimension for connecting territorial assets inclusively via dynamic pedestrian networks (Bruzzeze 2024).

The landscape matrix of planning can be implemented through the “experiential transect,” a concept introduced by the author that intends to overcome the traditional interpretation of the transect—viewed as a theoretical cartographic strip of territory—to propose the obligatory nature of direct landscape knowledge. This knowledge develops along articulated lines forced by orography, property regimes,

physical-functional characters, and the perception of safety, which relate almost entirely to fixed hot spots (Pistone et al. 2025).

In this perspective, the experiential transect is a landscape analysis method organized along a linear trajectory that requires the sequential study of ecological-spatial relationships. In conclusion, the experiential transect tool, applied to the theory of walkability, offers an operational opportunity to renew landscape knowledge practices, combining the rigor of territorial analysis with the subjective dimension of direct experience. This integration produces an epistemological model capable of restoring depth to the study of space, making the landscape a system of cultural, ecological, and social relationships.

The Phlegraean Fields Case Study: An Operational Protocol for Accessibility and Multi-risk Management

In the Phlegraean Fields case study, accessibility must re-stitch the fracture between the city composed of enclosed property sites and the lived city of a particularly dense urban fabric, constrained within a notably rugged orography that characterizes the volcanic landscape of craters, depressions, lakes, and coastline.

Furthermore, the presence of a pronounced multi-risk condition (seismic, volcanic, flood, social risk, etc.), together with the richness and fragility of a cultural and archaeological heritage of exceptional value, requires a cognitive approach that interprets the changing morphology through the mapping of the historical-cultural palimpsest and risk. The use of GIS allows for the integration of numerous geographic data sources, particularly data extrapolated from Civil Protection with those from the Ministry of Culture, understanding cognitive accessibility as an understanding of how escape routes can also favour cultural enjoyment paths. The analysis of urban voids allows for the mapping of vacant areas that act as potential connectors between major attractors. Multidimensional diagnostics highlight systemic morphological barriers, such as the Cumana railway, and perceptive barriers linked to invisible or submerged heritage. A key indicator is the “last mile” travel time between railway stations and archaeological sites, which allows for the exploration of real itineraries traversable for tourist purposes.

The guidelines for the co-design of integrated accessibility of the site act on the re-stitching of fragments by using blue and green infrastructure to create an adequate soft mobility structure. Digital accessibility for “denied” heritage also includes augmented reality stations that make heritage accessible even in inaccessible or submerged areas. The design of interstitial transition spaces, often degraded, existing between the road and the archaeological site, converts—reversing the value sense—leftover spaces into inclusive public squares. These premises led to a composite research methodology that connects the unique elements of the place by exploiting walkability and digital implementation. In this study, the experiential

Phase	Description	Tools & Technologies	Objectives
1. Transect Selection	Identification of linear paths based on the proximity to cultural/natural hotspots and local urban planning.	Spatial Analysis, Urban Planning Docs	Define the spatial scope and establish connections between isolated heritage sites.
2. Data Collection	Systematic gathering of physical, ecological, and functional attributes along the chosen routes.	GIS (OpenRouteService), Road survey sheets, Historical Cartography	Map the state of maintenance, sidewalk typology, lighting, and "last-mile" connectivity.
3. Community Involvement	Active engagement with residents and visitors to capture lived experiences and perceptions.	Likert-scale surveys (Google Forms), Participatory Mapping (Google My Maps)	Mitigate observer bias, identify "invisible" barriers, and validate territorial needs.
4. Digital Integration	Transformation of georeferenced data into interactive, multimedia narratives.	ArcGIS StoryMaps, AR/VR content, Multimedia layers	Facilitate "phygital" exploration, situated learning, and democratic access to information.

Fig. 2 Phygital transect research methodology

transect captures ecological, cultural, and perceptive dimensions through observational notes and participatory inputs. As a field protocol, the transect allows for the sequential reading of place attributes, aligning with transect walk approaches in urban research. It is an operational analytical protocol that defines a methodological framework for developing narrative outputs through a subjective lens, so that the user’s experience enriches the system and increases awareness of local criticalities.

In the co-design phase with local communities, it is necessary to emphasize that the landscape was understood primarily as an infrastructure of free public access and that, without the resolution of property conflicts and degradation problems, any intervention is destined to remain partial (Settis 2012). A radical form of inaccessibility is property fragmentation, which operates a spatial rupture via fences, transforming the common good into an exclusive panorama (Low and Smith 2006). In the Phlegraean Fields, for example, the privatization of lakefronts denies accessibility regardless of motor abilities, and the widespread degradation of public space, alongside the absence of natural surveillance, limits accessibility for vulnerable groups.

To address the multiple needs briefly illustrated, a methodological protocol was tested (Fig. 2), summarized in the following phases: selection of transects based on proximity to hotspots, GIS data collection, community involvement via questionnaires, and digital integration on ArcGIS StoryMaps.

These phases ensure transparency and replicability: routes were selected based on the capacity to connect landscape assets and essential services, also using the potential of the OpenRouteService tool for accessibility conditions. Road condition survey sheets mapped numerous characteristics such as prevalent use, maintenance status, sidewalk typology, and the presence of bus stops. Additionally, factors of liveability and perceived safety, such as lighting and physical decay, were recorded and classified.

Operationally, to construct the graph structure of the walkability network, the research implemented a spatial data model useful for describing the distribution of elements across the territory (Sharma 2021). This tool allows for the identification of services of greatest interest within a given action radius and explores soft mobility needs by favouring pedestrians in dense urban areas where infrastructure is inadequate. The structure is divided into base layers, legal constraints related to

DATA COLLECTION	Category	Data collection (GIS & Road survey sheets)	COMMUNITY INVOLVEMENT	Questionnaires (Google forms)	Co-mapping (Google My Maps)
	Parks and green areas	* Protected areas		Identification of the landscape unit	Maintenance ant type of road pavement
		* Urban parks			Presence of pedestrian paths
		* Public gardens		Mobility and fruition of socio-cultural assets	Presence of degradation
	Archaeological-cultural heritage	* Exposed			Perception of defense strategy
		* Superficial			Views and fencing/enclosures
		* Embedded		State of the connection system and future scenarios	Presence and quality of bus stps
	Public services	* Hidden			Questionnaires
		* Education			Street indicators
		* Public institutions		Personal information	Photos
		* Healthcare			
		* Cultural activities			
		* Neighborhood services			
	Transects	* Sports and recreation			
		* Type of road			
		* Level of maintenance			
		* Type of paving			
		* Type and presence of pavement			
		* Presence of lighting			
		* Signs of physical deterioration			

Fig. 3 Collected data and elaborated indicators in the phases 1-2-3

environmental risks, local hotspots, and the sustainable mobility system. Furthermore, the geospatial study was enriched by collaborative mapping to involve users: the community responded to Likert-scale surveys to optimize quantitative comparability between locations. Anonymous participation at hotspots provided evidence of daily mobility and local expectations, integrating field surveys.

Following the construction phase of the Spatial Geodatabase, the quality control phase is guaranteed by triangulating in situ observations, survey results, and updates from the collaborative platform to mitigate the “cognitive biases” of observers (Fig. 3).

Finally, the digital geo-storytelling tool has the potential to transform maps produced from indirect sources, survey sheets, and inhabitants’ perceptions into interactive stories that integrate multimedia data to build shared historical and socio-cultural processes of the area.

The ArcGIS StoryMaps application was used as part of the methodological workflow for the spatially anchored interpretation of elements present along the transects. The platform acted both as a visualization interface and as a participatory environment, supporting physical and digital (phygital) integration by linking physical exploration with augmented reality (Nofal et al. 2017). This approach aligns with citizen science (Haywood et al. 2024), valuing non-expert contributions to co-produce data on accessibility, and field exploration was augmented by AR/VR narratives that support digital learning without replacing physical involvement on site. The phygital layer provides orientation, enables temporal comparisons via swipe maps, diversifies flows toward alternative itineraries, and collects georeferenced feedback to refine transects. Reference is made to the storytelling website for an exhaustive and experiential understanding of the methodology and the Phlegraean Fields case study (Fig. 4).

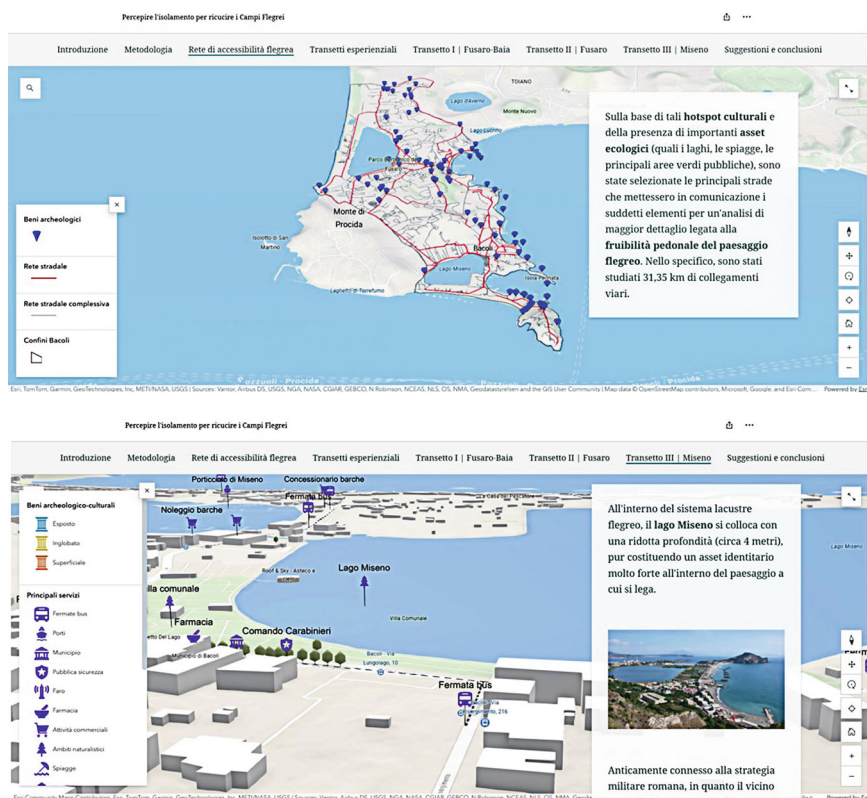


Fig. 4 Screenshot from the digital storytelling “*Perceiving isolation to mend the Phlegraean Fields. Experiential transects for enjoying the Phlegraean landscape*”

Landscape Paintings as Narrative Archives of Places

Landscape paintings can be interpreted as visual devices through which places are not only represented, but also culturally organized, selected and transmitted. Beyond their aesthetic value, landscape images are repositories of spatial knowledge, historical references and shared imaginaries, contributing to the construction of collective perceptions of places. As Cosgrove (1984) argued, landscape is not a neutral reflection of the physical world, but a culturally mediated “way of seeing”, shaped by specific historical, social and ideological conditions. In this sense, landscape paintings do not merely depict a territory; they frame it, according to prevailing cultural codes, recording both tangible and intangible dimensions. Architectural remains, topographical features and natural landmarks are often combined with atmospheric conditions, human presence, everyday practices and symbolic references that convey values, beliefs and ways of living and dwelling. Such images preserve also the traces of past spatial configurations, as a shared memory of a place. The archival dimension

of landscape paintings doesn't imply a static recording of reality but actively shapes the organization of knowledge and memory. Within this framework, landscape paintings can be regarded as mediators between the material territory and its immaterial dimensions, offering a powerful storytelling for "reading" a place and supporting recognition processes and memory and cultural transmission. The Phlegraean Fields have been internationally celebrated during the *Grand Tour* (Hamilton 1776); European travelers were captivated by the combination of volcanic features, lakes, hills, coastal vistas, and extensive Roman archaeological remains (Fig. 5).

Over the 20th century, however, an unplanned urban expansion altered this landscape, producing a dense interweaving of urbanized zones, archaeological sites and natural features. Perception is thus fragmented. Perception is here understood not merely as a process confined to the domain of vision, but as a multisensory, integrated and embodied activity, inseparable from interpretation and knowledge, recognition, past experiences and memory (Gibson 1979; Merleau-Ponty 1962). Cognitive studies emphasize that perception involves active meaning-making rather than passive reception, linking sensory experience to conceptual frameworks and learned categories (Neisser 1976; Barsalou 2008). Furthermore, perception is embedded within social and cultural contexts, where collective memory and shared symbolic systems influence how stimuli are recognized and interpreted over time (Halbwachs 1992). Cultural strategies are consequently essential in promoting a collective

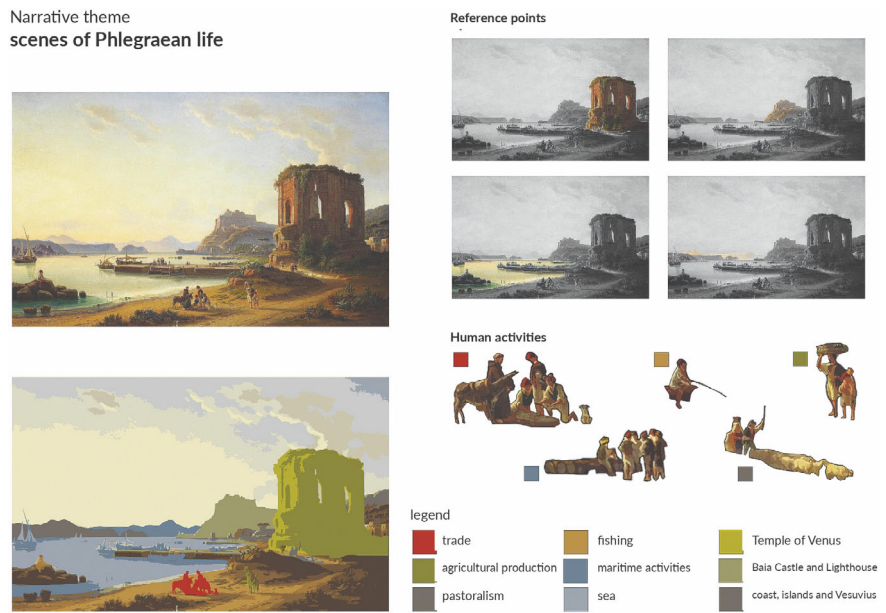


Fig. 5 Analysis of the compositional elements of the painting, giving to a narrative interpretation and according with the planes of depth represented in the painted space

memory and fostering local recognition of landscape value. In this context, narrative operates as an essential mediating tool, supporting immaterial heritage, linking communities to the *genius loci* and facilitating the intergenerational transmission of values, while transforming physical spaces into *loci* imbued with cultural and symbolic meaning.

Digital Technologies for Inclusive Accessibility to the Landscape

Landscape is not just a “place to look at,” but an immersive experience that intertwines memory, past experiences, and the whole body. This has driven our research, aimed at valorizing Phlegraean historical landscape, toward those representation strategies using an approach that guarantees accessibility to a wider range of users, characterized by functions and needs that require a customized design to ensure inclusion. Digital technologies can mitigate both physical and perceptual fragmentation, addressing landscape experiences to different audiences. People with Autism Spectrum Disorders, for instance, often encounter spatial disorientation, sensory overload and synesthetic interference in unfamiliar environments. An interactive web-GIS integrated by digital storytelling can serve as cognitive and perceptual filter, organizing sensory input and narrative information, reducing overload and preventing burnout (Recio et al. 2024). Similarly, visually impaired users could benefit from audio narratives and tactile 3D models to comprehend both immediate surroundings and distant skyline features (that would otherwise remain inaccessible), constructing a spatial mental map that, supported by the storytelling, can offer them a compensatory experience of the landscape. Phygital explorations (Pistone et al. 2025) of landscape and situated learning could provide more democratic access to information, transforming georeferenced data into interactive and multimedia narratives. Phygital experiences along thematic itineraries also support engagement for children, maintaining their attention and encouraging their active participation. Adopting a Design for All approach, the research designed inclusive landscape experiential paths, supported by immersive experiences, interactive visualizations and digital storytelling customized to age, cognitive conditions and sensory needs. GIS-based digital maps, DTM and ArcGIS StoryMaps can enhance the exploration of the Phlegraean landscape by georeferencing historical paintings in the original viewpoints of the artists. Such an approach allows the present to be understood through comparison with the past, highlighting permanence and transformations.

StoryMaps combine spatial data with textual, visual, and audio content, supporting participatory narrative and placetelling (Pollice 2022), while guiding users along interactive itineraries, aligned with historical viewpoints. This alignment generates emotional and cognitive engagement, strengthening the link between observer and landscape.

A GIS Narrative Approach for Inclusive Paths in the Phlegraean Fields

StoryMaps was used for the geospatial organization of pictorial images, repositioned in the real locations of the contemporary territory of the Phlegraean Fields: three-dimensional GIS maps and Digital Terrain Models (DTMs) were employed as scientific tools for an extensive analysis of present-day geomorphology, conducted through a comparative approach with the skylines and landmarks identifiable in the analyzed pictorial views. By comparing current views obtained through digital cameras embedded in the 3D model and placed in positions physically accessible to an observer on the ground, each painting was repositioned according to its specific viewpoint, presumed to be the location from which the artist depicted the scene (Fig. 6).

The use of the 3D basemap in StoryMaps and the visual exploration of the DTM made it possible to identify landscape continuities and transformations, to detach background skylines (landmarks for orientation) from the most narrative part of the painted image, depicting in the foreground daily lifestyles scenes, testifying to the irreverent relationship that local inhabitants have maintained over the centuries with the antiquities of their cultural landscape. We highlighted those areas presenting the highest concentration of pictorial works and the most recurring thematic elements in more than 200 mapped landscape paintings: 1. *Locus Amoenus o Terribilis*; 2. Legendary Landscapes; 3. Journey through the Phlegraean Fields; 4. Archaeological Sites; 5. Scenes from Daily Life (<https://storymaps.arcgis.com/collections/159dc1f9014a43698775c73c98e09e57?item=1>) which have enabled the design of certain visitor routes (in chapter n. 6 of our StoryMaps) that are genuinely accessible, despite the territorial fragmentation resulting from physical obstacles and/or areas of private property that cannot be traversed. Two detailed inclusive pedestrian routes have been designed (chapter n. 7) around Lake Averno and Lake Fusaro, where a significant concentration of fascinating paintings (and consequentially narratives) bond with high environmental and landscape features. The lacustrine basin of Lake Fusaro originated from the accumulation of volcanic and fluvial sediments along the coastline, which led to the formation of a littoral dune (De Pippo et al. 2004). This process progressively transformed an open marine bay into a semi-enclosed lagoon and, subsequently, into a brackish lake during the Greco-Roman period. During Roman times, the lake was exploited for fish farming (notably oysters and mussels) and fishing activities, while the presence of thermal waters and the scenic setting encouraged the construction of villas and thermal facilities in the surrounding area. In the 18th century, the lake was reclaimed and converted into a hunting and fishing reserve by the Bourbon dynasty, which commissioned the construction of the renowned Casina Vanvitelliana (1782), a representative architectural pavilion scenically located on the lake. This millennia-long stratification of natural and cultural layers—the remains of the so-called *Water Caves*, Roman thermal cisterns, currently in a state of severe neglect despite the constant spring of thermal waters directly into

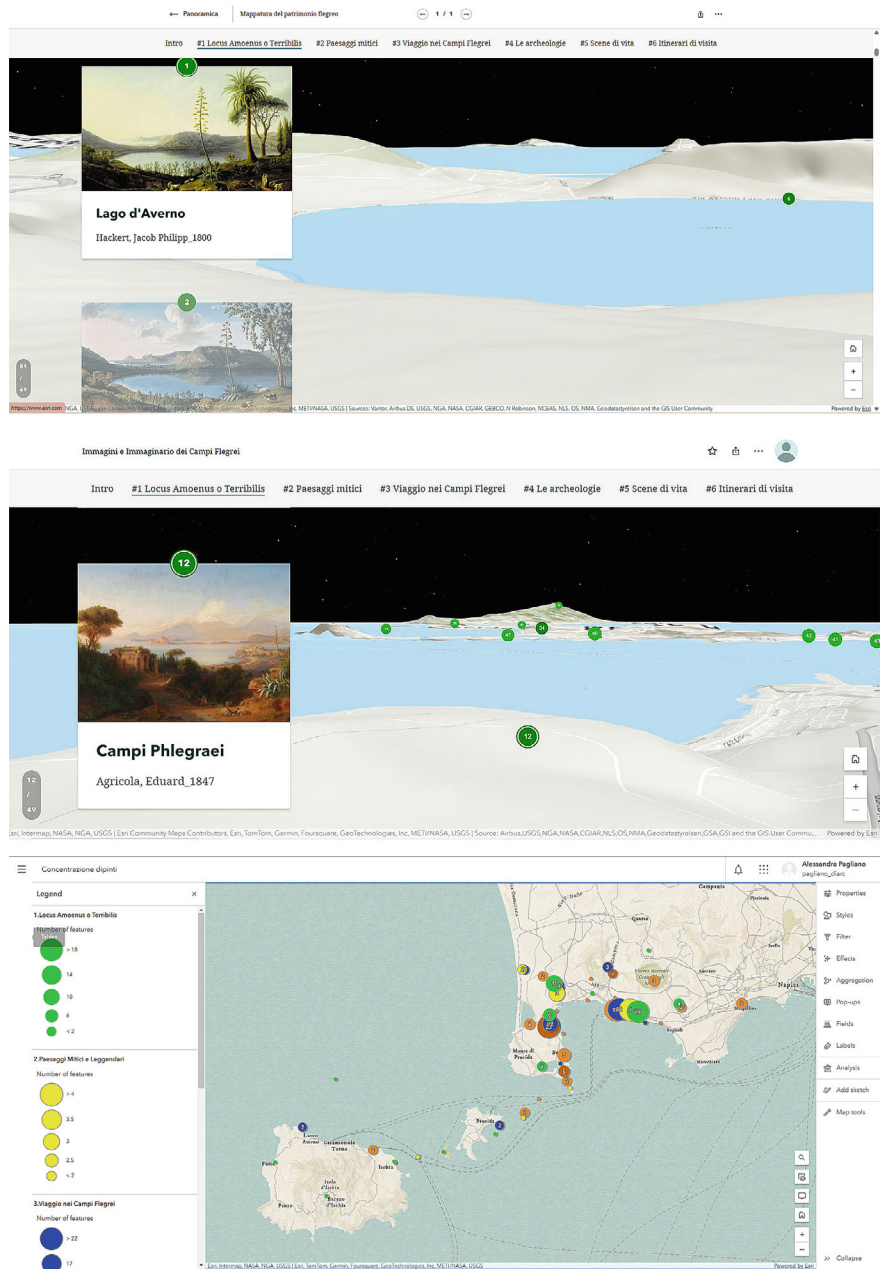


Fig. 6 Some images from StoryMaps that relocate the paintings to their original places and allow recognition of today's skylines from dynamic 3D maps

the lake and the remains of the so-called *Cassone*, a Bourbon-era fish-storage structure—has been interpreted and enhanced through some video storytelling aimed at providing communicative and cognitive tools facilitating a complete comprehension and engagement with cultural content of this multi-layered historical landscape. We designed a series of interactive information totems, positioned at the most significant locations along the route, supporting both narrative interpretation and site identification (Fig. 7).

Lake Averno was selected for several complementary reasons. Its circular path along the shoreline forms a continuous and easy pedestrian route (Fig. 8). Averno's landscape offers extended scenarios, reaching as far as the islands in the background, while a dense reed bed generates a distinctive and constantly evolving acoustic ecosystem. Ducks and other waterfowl provide visitors with a multi-sensory experience with their characteristic vocalizations. Moreover, the site is suitable for designing an inclusive route for visually impaired visitors, along which multisensory experience points can be installed where we previously mapped the paintings. In terms of storytelling, the lake embodies a unique interweaving of mythological narratives: it was traditionally identified as an entrance to the Underworld, it hosts the remains of the Roman Temple of Apollo, and the Sibyl's cave was incorrectly placed there.

The station points were designed to provide all visitors with a multisensory experience of the landscape. This experience is supported by tactile bas-reliefs of the painted views, for haptic exploration by visually impaired users. Through these bas-reliefs, also sighted users are encouraged to better identify and spatially locate landmarks and significant landscape features present in the surrounding environment (Fig. 9). The possibility of activating audio guides via personal smartphones, offering narratives on the historical and mythological dimensions of the site, further enhances the experience by compensating for the primacy of vision with the evocative power of imagination, thus framing landscape perception as a process not exclusively dependent on sight (Fig. 10).

Final Considerations on the Regeneration of the Phlegraean Landscape

The design of an accessible landscape must consider the totality of perceptions and operate transversally across urban planning and digital technologies. In the Phlegraean Fields, the challenge is the coexistence of a millenary heritage with a precarious urban reality, where accessibility restores dignity to places. The integration between walkability and digital tools overcomes the static nature of traditional museum displays by proposing an active enjoyment that transforms the visitor into an actor of knowledge. The choice of transects responds to the logic of connecting cultural emergencies and daily life, breaking down boundaries between the local population and archaeological sites. Sustainability lies in the ability to

- Stage n. 1_ The lake
- Stage n. 2_ The cultural heritage
- Stage n. 3_ The Roman beach
- Stage n.4_ The “Quarantena” park

Fusaro lake

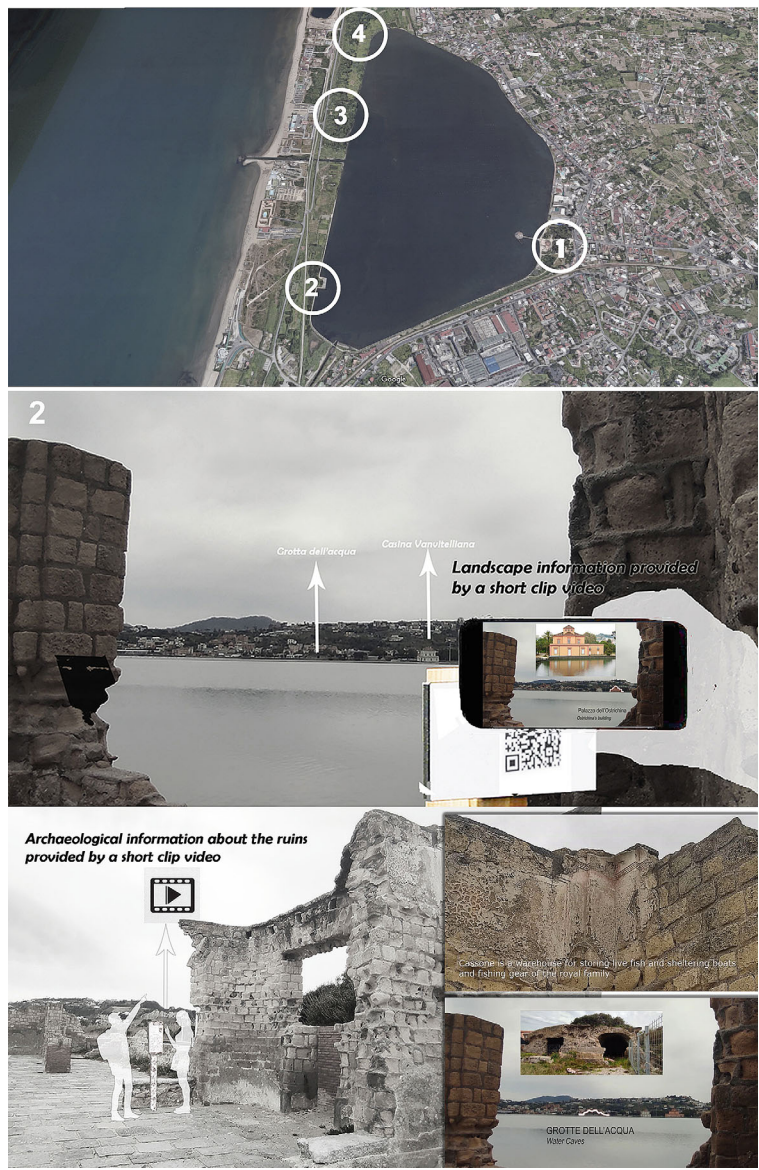


Fig. 7 Designing a phygital accessibility to the Fusaro Lake by means of multimedia and augmented reality contents provided along the pedestrian route

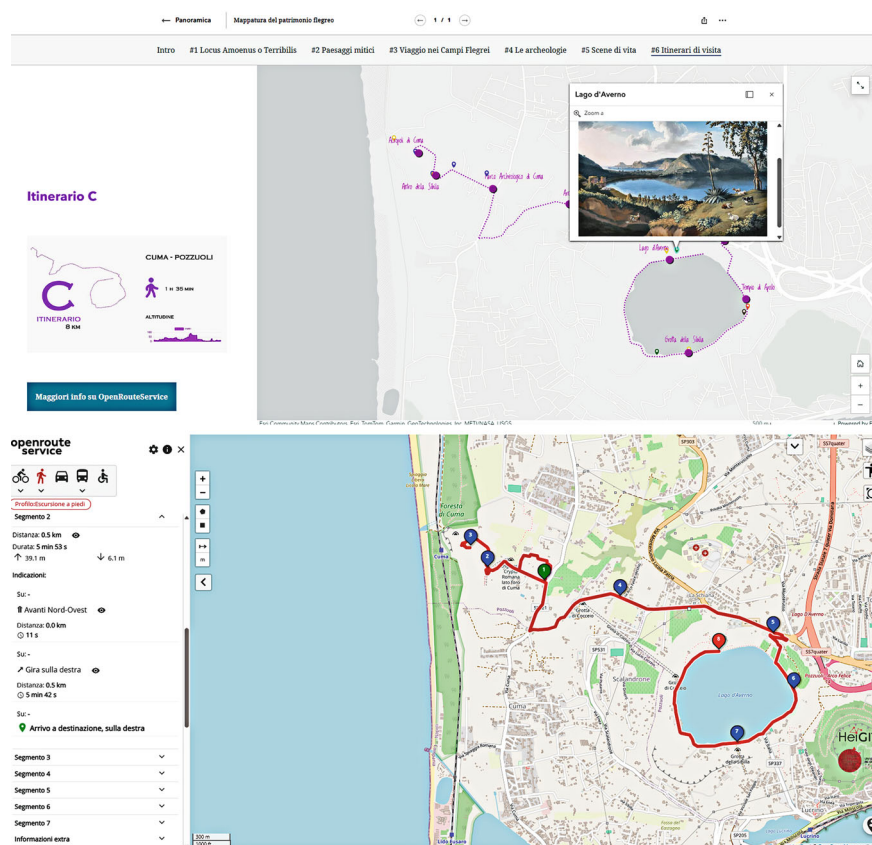


Fig. 8 From the thematic narrative route in StoryMaps to the physical experiential path around the Averno Lake

adapt to soil transformations, promoting soft mobility necessary in difficult territories. Direct involvement via participatory mapping underscores the importance of a bottom-up approach where lived experience evaluates design effectiveness. Integrated accessibility is a continuous process of negotiation between historical memory and contemporary needs, mediated by technologies that amplify the reading of space. Digital storytelling creates an identity link with the territory, favouring social re-appropriation of long-inaccessible assets.

The transparency of the method and its replicability offer a model exportable to contexts with similar environmental risks, laying the foundations for a design culture that centres human interaction. The multidimensionality of accessibility confirms that no enhancement exists without inclusion; the beauty of a place is proportional to its capacity to be understood by all. Walkability is the unit of measure of a civilization that chooses observation as resistance to homogenization, rediscovering the transect as a path of care for the common good. Research demonstrates that the landscape can



Fig. 9 Digital technologies as a mediation tool to support sensory and cognitive needs, according to the design for all principles

Curatorial project: Breathing Lake Averno — An immersive experience inspired by Alceste Campriani			
	Reference artwork Alceste Campriani (Terni, 1848–Lucca, 1933), <i>Anatre nel lago d'Averno e il tempio d'Apollo</i> Undated; pastel on paper mounted on wood; 70 × 100 cm.		
	Type of intervention Looping ambient video with voice-over guidance accompanying painterly micro-animations.		
	Context of enjoyment • Lakeside panoramic walkway • Multimedia room • Seating and listening areas • Suitable for an accessible, multisensory, and inclusive visitor experience.		
	Curatorial concept The project facilitates slow, contemplative engagement with the landscape. Alceste Campriani's painting creates a peaceful, contemplative presence capable of stimulating the viewer's imagination through a slow, multisensory narrative.		
	Description of experience Observers see the landscape of Lake Averno. A minimalist ambient soundscape—water, wind, and rustling reeds—suggests a living scene. A calm loop brings the painting to life through minimal, almost imperceptible painterly movements, conveying an immersive narrative that engages sight, hearing, touch, and the imagination.		
	Format and duration • Single loop duration: 50–55 seconds. • Seamlessly looping MP4 video with ambient sound.		
	<table><tr><td> Accessibility The project is designed for visually impaired and neurodivergent visitors. • Calm voice-over tone • Subtle visual movement • Slow, predictable pace </td><td> ★ Curatorial value The artwork becomes a medium for multisensory engagement with the painted landscape. The living painting invites contemplation of the landscape and frees the imagination from the constraints of time. It connects Campriani's late-19th-century poetics with the mysterious history and natural character of Lake Averno. </td></tr></table>	Accessibility The project is designed for visually impaired and neurodivergent visitors. • Calm voice-over tone • Subtle visual movement • Slow, predictable pace	★ Curatorial value The artwork becomes a medium for multisensory engagement with the painted landscape. The living painting invites contemplation of the landscape and frees the imagination from the constraints of time. It connects Campriani's late-19th-century poetics with the mysterious history and natural character of Lake Averno.
Accessibility The project is designed for visually impaired and neurodivergent visitors. • Calm voice-over tone • Subtle visual movement • Slow, predictable pace	★ Curatorial value The artwork becomes a medium for multisensory engagement with the painted landscape. The living painting invites contemplation of the landscape and frees the imagination from the constraints of time. It connects Campriani's late-19th-century poetics with the mysterious history and natural character of Lake Averno.		

Fig. 10 Curatorial project

be an engine of development if recognized as an open system capable of evolving with society. Every step along the transect is an act of re-appropriation, every piece of data in the GIS is a fragment of collective memory, and every digital narrative is a bridge toward democratic management of the territory. The Phlegraean challenge is emblematic of a human condition that seeks traces of its history in the landscape. The proposed methodology invites reflection on the designer's role as a facilitator of experiences, capable of using advanced technologies to rediscover the ancient gesture of walking. Ultimately, accessibility and walkability merge into a unified vision where physical limits are overcome by shared knowledge, making heritage a living legacy for future generations. Only through democratic accessibility will it be possible to transform the territory into a laboratory for social innovation, where history is not just the past but a project for the present.

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