

# The Ecology of Reuse in Heritage Contexts

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## Abstract

The emergence of heritage discourse within contemporary architectural debate is relatively recent and has often been motivated more by the search for design opportunities than by concerns for conservation. Its development has paralleled the evolution of heritage protection charters, which have progressively expanded the notion of heritage to encompass broader spatial and cultural dimensions, including both tangible and intangible values connected through collective memory. From the 1960s onwards, public opposition to the demolition of iconic urban landmarks such as Pennsylvania Station in New York and Euston Station in London fostered the reuse of abandoned buildings, particularly industrial structures. This process contributed to integrating heritage into architectural theory through the concept of cultural significance. While restoration belongs to a specialised technical field, reuse requires a broader professional approach that is environmentally responsible, promoting the recycling of existing structures and reducing energy consumption, costs, and waste associated with demolition and new construction. Reuse also entails social responsibility. In contexts marked by urban expansion, vacant new developments, and excessive construction, it challenges an economic model that has revealed limitations and encourages the productive use of existing resources. Beyond its environmental benefits, the conservation and reuse of existing structures strengthen local identity, reinforce a sense of belonging, and support the continuity of collective memory. The scope of reuse is therefore extensive, encompassing any structure that has lost its original function, regardless of its architectural or heritage value. Yet the heritage question remains central: how to assess, preserve, and transmit the intrinsic values of existing structures while accommodating new uses. In this regard, adaptive reuse offers an alternative to demolition or gradual abandonment by promoting the continuity of both the material and immaterial values embedded in the built environment. Ultimately, it encourages an understanding of heritage as a living system in which human and non-human actors coexist and interact.

Keywords: Adaptive Reuse, Immanence, Post-industrial Heritage

## Reuse as a Form of Resistance: an Act of Urban Resilience

The term “reuse” carries a certain radicalism within it. Although it is an ancient practice, carried out throughout all eras and cultures, the term “reuse” emerged, preceded by the adjective “adaptive”, in response to social demands against the demolition of significant, damaged, or disused buildings. The first to adopt this definition, in fact, was the Italian-American architect Giorgio Cavaglieri, who, in 1963, as a member of the AIA (American Institute of Architects) and the Municipal Art Society, led the citizens’ movement against

the demolition of New York's Pennsylvania Station. As he himself explained a few years later, he did so knowing well that it was impossible to stop the demolition and with the sole aim of preventing future losses—a goal he achieved, for example, as an architect, with the Jefferson Market Courthouse, which was converted into a public library in 1967.

During the same decade, countless examples of industrial architecture—particularly railway-related structures—disappeared across Europe due to functional and technological obsolescence. War damage from World War II was also partly to blame, along with the rise of road transport via private vehicles and air travel. As Juan Ayrault explains, in the United Kingdom, although the role of the railroad remained socially relevant, the deterioration of many facilities—documented in the 1963 Beeching Report—led to the closure and demolition of 4,000 of the 7,000 existing lines and stations. The most scandalous case was the demolition of London's Euston Station, the British capital's first intercity railway terminal, opened in 1838 and characterized by a monumental entrance arch, the Euston Arch, which, following its demolition in 1962, was destined to become a symbol of lost industrial heritage. As in the case of Penn Station, the numerous citizen protests—led here by the poet Sir John Betjeman, founder of the Victorian Society—failed to prevent the demolition of this station, but they did save Saint Pancras Station, where a statue commemorates his work (Ayrault 2022, 219).

### **The Evocative Power of Folk and Street Art**

In the case of Madrid, the Delicias station closed in 1969, and in 1970 the Goya station (Madrid-Almoroix line) was demolished; it was so named because it occupied the site of the Finca del Sordo, where the Spanish painter had lived during his final years and where his “black paintings”—now on exhibit at the Prado Museum—were found. A few years later, the other stations located on the outer line—now known as the Pasillo Verde Ferroviario—were closed and demolished, leaving no trace of their existence. In 2018, the urban landscape of the defunct Peñuelas station was recreated in a mural by street artist Soen Bravo at the very site where it once stood, using the wall of the municipal swimming pool as a canvas (Fig. 1). The mural depicted the customs building with trains arriving, until it was removed in 2023 by the municipality, sparking neighborhood protests demanding its restoration in 2024 through the Madrid City Council's citizen participation portal (Madrid City Council 2024). As a first conclusion, it can be stated that reuse stems from refusal—that is, from the rejection of violent actions aimed at demolishing and erasing significant elements of urban memory. In the case of train stations, they represented the gateways and entryways to cities<sup>1</sup>. Vincent Scully said in his critique of the replacement of Penn Station with a drab underground station that people used to enter the city like gods, but now they slip away like rats. On the other hand, the loss of some of these stations sparked protests that helped save others from the same fate. That is what we call heritage—that which is inherited and understood as our own, even before others define it as such. That appreciation is the focus of this argument. In fact, the question of whether all pre-existing elements can be protected and/or preserved will be answered by appealing to thoughtful decision-making—following the study, analysis, and consideration of the social, natural, and built environment—to a sense of responsibility toward future generations, and to methodological rigor, in a synthesis of memory, art, culture, society, and nature.



Fig. 1. Mural by the artist Soen Bravo, depicting the now-demolished Peñuelas Station (Photo by Graziella Trovato)

### **Big Bellies: Reuse as an Expression of Our Time**

Another important aspect of reuse is that it constitutes an act of recycling that can be freely applied to any object of any characteristic and scale. The adjective “adaptive” indicates that we will have to consider how to adapt the new use to the existing structure. In the absence of standardized heritage protection, there are no established guidelines for how this adaptation should occur. Nor is it clear whether the interest or urgency of the new use takes precedence over respect for the formal, structural, and symbolic characteristics of what already exists. On the other hand, nothing requires consistency or correspondence between the existing form and the new function. While the form and use of objects were traditionally interrelated (use shaped, gave form to objects), reuse refers to a form of reappropriation in which every function has a place. This discontinuity between form and function characterizes the contemporary world.

While the design of tools once reflected their specific use (hunting tools, kitchen utensils, and laboratory equipment are generally equipped with handles, grips, or knobs, often decorated according to the materials, the era, and local taste), contemporary objects—whether smartphones, cars, or buildings—are characterized by a neutral, impenetrable shell, detached from the complex mechanisms that govern them. If we compare a landline telephone from the second half of the 20th century with a contemporary mobile phone, we will clearly see that the former was composed of parts that, through their design, interacted with the five senses: the handset is an elongated piece shaped to be held in one hand and brought close to the mouth and ear at the same time; its length is calibrated according to the distance to these senses, and its cross-section is variable to fulfill its assigned function. At the base, shaped like a pyramid to ensure stability, sits the rotary dial designed to dial numbers mechanically and, therefore, with holes corresponding to the numbers into which the fingertip fits, which in turn drives the necessary movement. In architecture, too, form revealed function through a series of functional and aesthetic codes: a tower signaled the

presence of a religious and/or urban landmark, a pediment that of a temple, a semicircular auditorium that of a theater, and so on. None of that happens today: a smartphone is as impenetrable as a tablet, a car, or the double skin of glass or acrylic in a contemporary building. And that is what happens when reuse is indifferent to the essence of what came before and treats it as if it were a vast womb, emptying it of content and meaning. If we focus on railway stations, we can cite two examples from the 1980s in which different strategies were employed but which achieved the same result in the terms we are discussing here: the first is the Gare d'Orsay in Paris, built in the early 20th century and converted into a museum by Gae Aulenti through a somewhat invasive intervention that altered the scale of the central space by inserting fragmented pathways and fixed elements of varying sizes; the second, more successful example is the conversion of Madrid's Atocha passenger station, built in 1888 by Alberto de Palacio Elissagüe, into a huge greenhouse. Rafael Moneo, who designed the expansion, relocated the railway operations to the added wings, thereby preserving the central space, which was transformed into a large tropical atrium for recreational and tourist use.

### **Immanence vs. Transcendence: The Radical Materiality of Urban Life**

But it is in the former warehouses for small supplies and telegraphs—located near the tracks in the station's southern section—that the heart of the station and of the MZA (Madrid-Zaragoza-Alicante) company, to which it belonged, is preserved. It is a small private museum, the Museo la Neomudejar, founded in 2013, which today also serves as a Railway Interpretation Center. In its rooms, lit by the original skylights, the exhibited works coexist with machinery and equipment of various sizes that once brought the station to life: clocks, blueprints, tools, telephones, ledgers, uniforms, machinery, and original furniture. And, above all, a massive Atlas Diesel generator from Stockholm, which supplied electricity to the entire station complex (Fig. 3).

From an architectural standpoint, La Neomudejar is a minimal intervention. Compared to the large-scale architectural projects mentioned earlier—which were significant due to their media and economic impact—we could define it, by contrast, as insignificant. It is not, however, if we consider its value in terms of cultural, social, and symbolic authenticity. It lies in the interplay between movable and immovable heritage and the cultural and social significance that this interplay generates. In this space, in fact, we perceive the immanence (from *immanere*, derived from *manere*, or “that which remains”) of the station's life as an integral, pulsating, and unifying element of urban life. It is this other aspect of reuse that we wish to highlight here: whereas restoration refers to an intervention on something endowed with recognized heritage values—with effects that go beyond the simple reuse of the architectural element—reuse brings into play the very life of things, in relation to the human and non-human beings who used and/or reuse them.

It can therefore be carried out without the intention of interfering with the composition or sensitive aspects of the pre-existing structure, with the sole purpose of providing a benefit to society while ensuring the building's temporary viability. From the perspective of heritage in general and industrial heritage in particular, this term is used here with the intention of drawing attention to the intrinsic qualities of what already exists, beyond purely aesthetic and superficial aspects, even if in the broadest sense of the term. Immanence can be understood as inherent to each element or living being, but at the same time, in a radical



Fig. 3. The interior of the Museo la Neomudejar, where the old engine that powered Atocha station can be seen (Photo by Graziella Trovato)

sense, “the situation of a reality insofar as it is intimately linked to another, from which it derives the premises and guarantees of its development and affirmation.” Rosi Braidotti defines it as “the radical materiality of life, of living systems that coexist and cooperate (...), a horizontal, relational way of thinking about life, outside the hieratic fashion of transcendence” (Braidotti 2026). Landscape, urban, architectural, or typological values—as well as constructive and structural ones—and, of course, those of cultural and social significance are often immanent to and therefore intrinsic to industrial heritage.

### **Post-Production and Reuse: Reprogramming the World**

Reuse can ultimately be understood as the art of reprogramming things and the world from a postcolonial and ecological perspective that is more cross-cutting and sensitive to both the natural and built environments. Nicolas Bourriaud defines this approach as “postproduction”—a process carried out through specific, contained actions that establish new conceptual and physical relationships between pre-existing elements and users. This is something we already find in much of contemporary art. According to this French critic and historian, one example in architecture is the reuse of the Grand Palais de Tokyo in Paris, carried out by Lacaton and Vassal in 1999. In fact, according to the competition guidelines established by the French Ministry of Culture, the goal was to transform the pre-existing building—which had been abandoned since the creation of the Centre Pompidou—into “a space for contemporary creation” that would bring the public closer to the various forms of current artistic expression, while adhering to two fundamental premises: a meager budget and an explicit reference to the term “installation.”

The result is an industrial-looking space that reveals its structure and facilities and which, in the words of its designers, transforms depending on the activities of its participants. The old skylights have been replaced by those commonly used in the agricultural industry, which incorporate automated ventilation systems, while the stripped-down structure of the former 1937 World’s Fair palace has been selectively reinforced. If the term “production”

is synonymous with creation, elaboration, and original composition through the use of raw materials (from the Latin *producere*, itself derived from *ducere*, “to lead”), the concept of post-production emerged in 1989 in digital culture as a set of operations—such as dubbing, editing, mixing, and the eventual digital processing of sequences with special effects in videos, photos, or music tracks—that precede the staging and/or marketing phase. According to Bourriaud, the contemporary creator acts like a DJ: rather than generating or composing new forms, they reprogram and combine existing ones, drawing on their information.

«In a universe of products for sale, of preexisting forms, of signals already transmitted, of buildings already constructed, of paths already traveled by their predecessors, artists do not view the artistic field as a museum containing works that must be cited or “surpassed,” as the modernist ideology of the new demanded, but rather as a series of warehouses filled with tools to be used, a repository of information to be manipulated and then brought to the stage» (Bourriaud 2004, 13).

A prime example is the recently inaugurated *Infinito Delicias* building in Madrid. Located near the station of the same name, it occupies the former office and metalworking workshop complex on Juana Doña Street, designed by architect Enrique Simonet in 1963 (fig. 5). These structures were not listed, and their significance lay more in their typology than in their form. The comprehensive renovation carried out in 2023 is the result of a long interdisciplinary process developed by Husos and Eliú + Ultrazul + the Daniel and Nina Carasso Foundation, in which architecture itself is conceived as a manifesto for a way of understanding the contemporary world, promoting a culture committed to the environment and fostering social interaction through innovation and experimentation<sup>2</sup>.

The selection of this foundation’s headquarters has been part of this lengthy process. The architects have preserved the reinforced structure and the typological character of the existing building, keeping the two interconnected sections linked by a central lobby: the first, originally used for offices, is six stories tall, and the second, the metallurgy workshops, is two stories tall with four sloped roofs featuring sawtooth skylights. They have, however, transformed the façade through a superimposed three-dimensional bioclimatic structure, built of chestnut wood to house sunshades, plants, and irrigation systems on each floor. The building also incorporates renewable energy systems and gardens in the intermediate spaces. «In the context of the climate crisis, » the architects state, «the project addresses socio-ecological challenges that we believe require urgent attention. On the one hand, based on the consideration that every construction detail, material specification, and spatial strategy entails an ecological commitment to others (humans, non-humans, future, present, and past generations, diverse bodies) across multiple scales—both spatial and temporal. On the other hand, these challenges must be addressed through desire: the building confronts ecological challenges as an opportunity to experiment with other ways of living together, of building, and of opening up new imaginaries where we can dream of futures less focused exclusively on the human.»

### **Conclusions: The Ecology of Reuse in the Context of Cultural Heritage**

This article has argued that reuse is a radical practice—both an ancient and a contemporary virtue—due to its ability to address some of the issues of our time. At the same time, this article has sought to explore the limits of reuse in contexts that may be considered heritage

sites. These include both those recognized and regulated by the legal framework and those that are not, yet harbor social, cultural, and environmental values that are recognized and identifiable following a responsible analysis by the relevant stakeholders, whether public or private. The citizen movements we have referred to in this article defended as heritage something that, as such, was not recognized. Today, the term “heritage” has taken on new meanings that broaden its scope of application—a scope that is, of course, no longer limited to mere monuments.

This expansion of the heritage field is both an achievement and a limitation that should alert us to the potential banalization of the very concept of heritage. A sign of this came from the exhibition *Cronocaos*, curated by OMA at the 2010 Venice Biennale, which used graphics to show an entire planet progressively subjected to varying degrees of heritage protection. «Everything is protected today,» argues Koolhaas, who lashes out against the legislative framework governing heritage for preventing architecture from adapting to new uses and instead leading to processes of mummification, comprehensive reconstruction, and/or masking: a new building—often larger in volume and taller—is constructed behind the supposedly original, restored façade.

What, then, happens if protecting everything means protecting nothing? One answer comes, for example, from Critical Heritage Studies, which propose new perspectives grounded in a postcolonial and ecological consciousness that is more cross-cutting and open to new forms of reuse of the natural and built environments, understood as part of a whole. Repairing and caring for our environment are now viewed as radical acts when accompanied by artistic actions capable of engaging with local materials and cultures that reveal new paths and perspectives.

This article has advocated for reuse over demolition, both in the case of buildings subject to heritage protection (in which case regulations must be applied through interpretation) and those not subject to such protection. First, because it is a sustainable recycling practice in ecological and energy-saving terms. Second, because it is a practice of caring for our environment in a holistic sense, in which the body, architecture, and the social and natural environments coexist and nourish one another.

If deemed necessary, demolition must always be carried out in a thoughtful and justified manner, following a thorough analysis and assessment of the history and social and cultural significance of the building or complex, and after consulting with the public and neighborhood associations. The poor state of preservation should be a secondary factor in this decision: the partial or total deterioration of a property can never, on its own, justify its demolition. Demolition should always be carried out by consensus, with the government acting as an intermediary in the case of private property. Disuse can be addressed through regulated mechanisms for temporary management that serve the public good. This would extend the life of buildings over time, in harmony with local needs. Vegetation, which often grows spontaneously on disused structures, can be conserved and preserved, as has been done with the ruins of ancient Rome, which today form integrated islands within the city. The same applies in the case of the partial demolition of buildings or complexes.

The operations mentioned in this text demonstrate the possibility of acting in a responsible yet innovative and experimental manner, generating real benefits on various scales, from the global to the neighborhood level. All of them begin with a study of existing conditions, which they highlight through their interventions. We conclude by quoting from the

Radical Rehab manifesto, Architecture and Heritage in Spain (1975–2025): «In a country where historical legacy constitutes one of the main cultural, social, and tourist assets, the conservation and transformation of architectural heritage transcend disciplinary boundaries to become a collective commitment»<sup>3</sup>. It is not, therefore, merely a matter of curbing the disposal of products and extending their life cycle, but rather of considering buildings from a comprehensive, socially inclusive perspective and as part of a cultural fabric in which both natural and human-made elements participate.

## Notes

1. This refers to the conversation held with Jorge Otero-Pailos as part of the Radical Rehab Seminar: “The Challenge Facing Heritage Today.” Otero-Pailos defends this dual connotation of the term “reuso-rehúso,” which is valid in both Spanish and English.
2. The spatial layout and architectural design are by Husos arquitecturas (Camilo García, Diego Barajas) + elii [architecture firm] (Uriel Fogué, Eva Gil, and Carlos Palacios). The development of Ultrazul’s economic, management, and social innovation model is by Julia López Varela + Zuloark.
3. The exhibition “Radical Rehab: Architecture and Heritage in Spain (1975–2025)” has been curated by Ángela Juarranz and Carlos Mombiela at the Casa de la Arquitectura (April 22, 2026–March 28, 2027), featuring a selection of 80 works of varying scales built over the course of half a century throughout Spain. Scientific Committee: Bie Plevvoets, Alfonso Muñoz Cosme, Jorge Otero-Pailos, and Graziella Trovato.

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Fig. 4 View of the surroundings of Infinito Delicias. On the right is the new three-dimensional façade made of chestnut wood. In the background, the old railway workers' houses can be seen. (Photo by José Hevia. Architects: Husos&celii)