


# Architectural Strategies for Adaptive Reuse of Buildings to Create Affordable Housing

Kristina Andreevna Pshenichnikova <sup>a</sup>

*Moscow Institute of Architecture (State Academy), Fundamentals of Architectural Design, Russia, Moscow, 107031,  
Rozhdestvenka street 11  
k.a.pshenichnikova@gmail.com*

**Keywords:** affordable housing, adaptive reuse, sustainable urban development, conversion of defunct buildings.

**Abstract:** The rapid development of modern society exacerbates the problem of affordable housing shortages: according to the UN, over 1.8 billion people live in substandard housing conditions, highlighting the global scale of the crisis. At the same time, the number of buildings that have lost their original purpose and negatively impact the urban environment is increasing, necessitating the search for effective solutions. Such spaces lead to the degradation of territories, increased social exclusion, and the inefficient use of resources. One promising approach to addressing these issues is the adaptive reuse of buildings. This strategy involves repurposing abandoned buildings for affordable housing and introducing new functions into vacant urban structures, enhancing their social significance. The integrated application of such approaches contributes to the development of sustainable and ecologically balanced urban communities. The results of the study demonstrate that the adaptive use of buildings is relevant for socio-economic development and increased environmental sustainability, enabling a multifunctional approach to urban renewal.

## 1 INTRODUCTION

Rapid urbanization makes providing affordable housing a priority, especially in cities with limited resources and space. The deterioration of architectural structures and the loss of their functions necessitate the search for innovative solutions for the transformation of abandoned buildings. Amid technological and social change, architects strive to balance the preservation of historical heritage with the adaptation of the architectural environment to modern requirements.

Unlike complete restoration, which is often economically unfeasible, adaptive reuse transforms abandoned buildings into modern living spaces while preserving their architectural significance (Dave, 2008). This concept reduces resource use, preserves cultural heritage, reduces environmental and human impacts, and integrates restored properties into the urban fabric, promoting greater housing affordability for diverse populations.

From the perspective of sustainable development, the key criteria of a modern city are: affordable housing, development of transport infrastructure, environmentally sustainable and open urban


development, protection of cultural and natural heritage, reduction of environmental impact and greening of areas (Perris, 2013).

As opposed to demolition and new construction, preservation reduces energy costs and provides environmental and economic benefits. Renovated buildings become hubs of urban activity, create a unique character, and promote cultural continuity and social support (Cantell, 2005).

Contemporary practice implements projects to transform industrial and religious buildings into social housing, as well as adapt existing residential and office buildings. Adaptive reimagining is becoming a method of architectural renovation and a factor in the sustainable development of urban areas.

Despite the additional economic and organizational costs associated with the restoration and transformation of buildings, these can be minimized through comprehensive architectural analysis, effective planning, and the implementation of innovations. This approach preserves valuable architectural structures and integrates them into the modern urban environment, improving quality of life and the sustainability of infrastructure.

The article discusses:

<sup>a</sup> <https://orcid.org/0000-0003-2781-1973>

1. A critical analysis of the literature on the topic under study.
2. The prerequisites for the development of the concept of adaptive reuse of buildings.
3. The main typologies of buildings converted for social housing in contemporary architecture.
4. Key strategies for the adaptive reuse of derelict buildings in the 21st century.

## 2 LITERATURE REVIEW

Scientific research and design concepts in the field of adaptive reuse of unused buildings for the creation of affordable housing are considered. The potential of this approach as a sustainable and economically justified solution to the problem of the growing shortage of living space in cities, taking into account the influence of economic factors, has been assessed (Ayumu, Ohakawa, 2023).

The methodology of transformation of unused urban spaces into social housing for the self-employed was studied using the example of Ho Chi Minh City (Ngo, Nguyen, 2021), as well as the adaptation of high-rise buildings for housing needs based on the analysis of the central business district of Istanbul (Aydemir, Akın, 2024).

The work on strategies for the adaptive use of industrial heritage in the process of reconstruction of the Western Bund Embankment in Shanghai (Ma, Li, Lan, 2023) is of interest. Special attention is paid to the adaptation of industrial facilities with historical value (Cantell, 2005).

The historical prerequisites for the development of the adaptive reuse concept are analyzed (Lanz, Pendlebury, 2022, Valdiviezo, 2025).

An analysis of the experience of Canada's largest cities in the field of urban renewal demonstrates the possibilities of integrating various approaches aimed at preserving cultural heritage and providing affordable housing. This highlights the importance of integrated strategies at the level of design and spatial planning (Tsenkova, 2023).

Aspects of sustainable development in the context of adaptation and reuse of buildings are considered separately, environmental benefits, energy conservation and improvement of social conditions in the urban environment are highlighted (Perris, 2013).

## 3 PREREQUISITES FOR THE FORMATION OF THE CONCEPT OF ADAPTIVE REUSE

Throughout history, the buildings have been repeatedly reused for pragmatic and symbolic reasons. Significant changes in approaches to urban development occurred in the middle of the 20th century. This was due to the criticism of radical modernist methods (Lanz, Pendlebury, 2022). In response to increasing environmental awareness, a new trend emerged — "adaptive reuse", reflecting the desire to preserve the environment and popularize the conversion of buildings for new tasks.

In Italy, this concept was developed in the 1960s and 1970s as part of the "holistic conservation" ideas for Bologna's historic center, defining a new direction for the preservation of cultural heritage with an emphasis on architectural sites (Valdiviezo, 2025).

Rethinking the approach to historical heritage in architecture took considerable time, and gradually a new cultural position emerged, based on a shift in the relationship between history and the perception of existing buildings. A trend emerged in contemporary architecture, represented by architects of the late 20th and early 21st centuries, such as Heinz Bienefeld, Karl-Josef Schattner, Carlo Scarpa, Gottfried Böhm, and Guido Canali (Cejka, 1995). Their approach is distinguished by a careful attention to historical sites, particularly when adapting architectural monuments.

### 3.1 The Main Historical Prerequisites for The Development of The Concept of Adaptive Reuse

#### *Reaction to modernism*

In the middle of the 20th century, the modernist architectural movement emphasized the priority of new construction over the possibility of transforming existing facilities. However, in the 1960s, a reaction against radical renewal began (Lanz, Pendlebury, 2022). Architects, including representatives of early postmodernism, returned attention to history, context, and humanistic values in architectural discourse.

#### *Economic changes*

The processes of deindustrialization in Western European countries have led to the appearance of numerous abandoned industrial buildings. These spaces required new functions, which stimulated the development of rational reuse practices.

#### *Preservation of architectural heritage*

Interest in historical and cultural heritage has led to the formation of a movement for the preservation of

architectural sites. As a result, adaptive reuse acquired an ideological basis and turned from a utilitarian solution into an architectural method combining economic expediency and cultural continuity.

*Formation of the concept of adaptive reuse*

It was during this period that the term "adaptive reuse" entered the professional lexicon, denoting an approach to rethinking old buildings and integrating them into the modern urban environment (Lanz, Pendlebury, 2022). Unlike restoration or renovation, this creates opportunities for new functions while preserving authentic architectural elements.

### 3.2 Modern Prerequisites of Adaptive Reuse

In recent decades, adaptive reuse has become increasingly relevant both in professional practice and in academic research. Today, the concept is used both in large-scale projects by leading architects and in local initiatives. The methodological basis of adaptive reuse is based on cultural heritage preservation paradigms, sustainable development strategies, and consideration of social aspects in the context of the global housing crisis.

## 4 MAIN TYPOLOGIES OF BUILDINGS TRANSFORMED FOR SOCIAL HOUSING IN MODERN ARCHITECTURE

The study conducted a comprehensive analysis of the main typologies of buildings that are in an abandoned state or in need of restoration. These facilities have been transformed into affordable social housing based on the concept of adaptive reuse. The following categories are highlighted:

1. Industrial buildings and production complexes
2. Religious buildings
3. Residential complexes
4. Office buildings
5. Medical and recreational buildings.

The adaptation of these facilities takes into account modern requirements for the quality of the urban environment, energy saving standards and environmental safety. This leads to the expansion of the housing stock, the development of social infrastructure and the preservation of architectural and cultural heritage. The implemented projects confirm the relevance of adaptive reuse for the integration of buildings that have lost their function into the modern urban context.

### 4.1 Industrial Buildings and Production Complexes

The project is redeveloping a 7-hectare former industrial site in Hayes, West London, to create a mixed-use and sustainable urban development, including affordable social housing and integrating historic heritage with contemporary urban design.

The Old Vinyl Factory project is supported by the Good Growth Fund, established by the Mayor of London in 2012 (Fig. 1). The former EMI factory is being transformed into an architectural cluster comprising over 600 residential units, commercial premises, and educational institutions (Wilson, Carr, Bird, 2013). The site, previously occupied by industrial units and car parks, was redeveloped under the direction of Studio Egret West, in collaboration with the council and the developers.



Figure 1: Historical photo (top right) and condition at the time of the beginning of construction of the factory for the project The Old Vinyl Factory, 2012. Source: <https://studioegretwest.com/places/the-old-vinyl-factory>

Initially, 144 residential units were supposed to be created, but the new master plan provides for the placement of 650 apartments, as well as public, educational and research institutions (Fig. 2). The concept forms a 24-hour urban "campus" with a harmonious combination of residential, commercial and recreational areas united by the pedestrian axis of The Groove and thematic areas: Gramophone Grove, Vinyl Square, Powerhouse Square.



Figure 2: Structural town-planning vision of the project (left) and perspective view (right). Source: <https://studioegretwest.com/places/the-old-vinyl-factory>

The Boiler House is one of the UK's largest residential construction projects using laminated wood structures, which helps reduce the carbon footprint. The facade is made of stainless steel with an external accent — an orange staircase in the style of the industrial past (Fig. 3). Landscaping is expected at all levels of the complex and is accompanied by a long-term environmental control program.

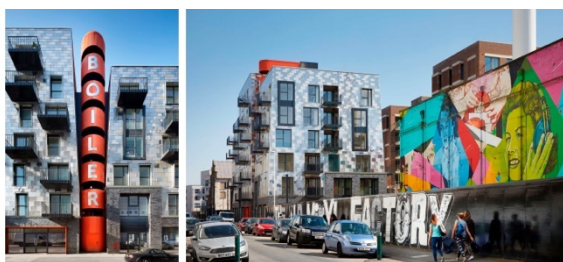


Figure 3: The Boiler House. Source: <https://studioegretwest.com/places/the-old-vinyl-factory>

The adaptation of The Old Vinyl Factory is an example of a synthesis of the revival of industrial heritage, as well as innovative environmental design in the creation of affordable housing and community centers, forming a modern sustainable urban space.

## 4.2 Religious Buildings

In 2018, the Tectône architectural bureau was involved in the comprehensive renovation of the historic complex located on Avenue de la Liberté in Charenton (France), the former chapel of Saint Madeleine Sophie Barat, built in 1942 by architect Charles Venner (ArchDaily, 2022). After the removal of the sacredness status and the acquisition of the building by the Emmaus Liberté social movement in 1972, the territory was expanded and transformed many times in order to accommodate affordable housing and social infrastructure for the supported communities of the former homeless.

The main idea was to carefully restore the former chapel, as well as the pavilion attached to the back of the site, followed by the construction of a superstructure over the main volume made of wood and zinc-coated steel, emphasizing the difference between the old and new architecture (Fig. 4).



Figure 4: A chapel transformed into affordable housing, architect Tectône. Source: <https://www.archdaily.com/1004374/from-old-chapel-to-thrift-shop-and-social-housing-TECTONE>

The solution made it possible to increase the capacity and organize functional zoning: on the ground floor there is a space for a charity shop that provides work to residents of the community, and on the upper floors 10 individual residential modules with separate sanitary units were placed, supplemented by a common laundry room on the first residential level (Fig. 5).

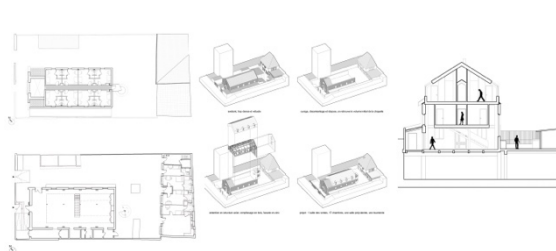


Figure 5: Drawings and schemes of functional zoning. Source: <https://www.archdaily.com/1004374/from-old-chapel-to-thrift-shop-and-social-housing-TECTONE>

The project is an example of a harmonious approach to the preservation of cultural heritage and the application of modern architectural concepts in the adaptive reuse of existing buildings. The implementation of residential modules in the former chapel building demonstrates the potential for creating an inclusive urban environment in the context of preserving historical heritage and current social challenges.

## 4.3 Residential Complexes

As part of the modernization of the Les Habitations Saint-Michel Nord residential complex from the 1970s, located in the socially disadvantaged Saint-Michel district of Montreal, the architectural firm Saia Barbarese Topouzanov implemented a project designed to change not only the appearance of buildings, but also their social perception (Brillon, 2021).

The apartments lacked natural light, and the building's poor energy efficiency made them inconvenient and expensive to maintain. The idea was not so much to radically change the structure, but rather to integrate new functions that improve the quality of life and safety of residents, as well as contribute to the development of the modern identity of the district.

The team of authors sought to destroy stereotypes about social residential architecture and the negative assessment associated with it. The transformations of the complex made it possible to create a bright, bright and safe space, and the redevelopment of the premises by transferring stairs to the street made it possible to organize a two-way orientation in most apartments, which improved insolation and ventilation (Fig. 6).



Figure 6: Transformation of the Saint-Michel Nord housing complex by Saia Barbarese Topouzanov. Source: <https://www.dezeen.com/2021/10/27/les-habitations-saint-michel-nord-saia-barbarese-topouzanov-architectes/>

The result shows how the architectural concept is able to go beyond the traditional reconstruction, allowing the integration of new mechanisms of social interaction, collective unity and sustainable development.

#### 4.4 Office Buildings

The project, completed in 2023 by teams of architects and located in the 7th arrondissement of Paris, showcases the transformation of office buildings into social housing with modern and functional spaces.

The Îlot Saint-Germain project consists of two interconnected buildings: an 18th-century stone building to the south and a 1970s concrete building to the north, surrounding a courtyard. These buildings previously belonged to the Ministry of the Armed Forces and were used as office space (Astbury, 2024). The architectural firms were tasked with converting the offices into 254 social housing units, as well as adding a gym and a kindergarten for residents and the community.

The transformation was approached with two approaches—technical and rational. The proposed housing is the result of research that allowed for

openness to the environment, efficiency, flexibility, and adaptability to a modern lifestyle. One of the main objectives was the preservation and restoration of the existing architectural elements, emphasizing their original materials—light stone and concrete (Fig. 7). These same materials are used in the new sections of the complex.



Figure 7: Îlot Saint-Germain Building Project / François Brugel Architectes Associés + h2o architectes + Antoine Regnault Architecture + Elise et Martin Hennebicque Paysagistes. Source: <https://www.dezeen.com/2024/05/03/ilot-saint-germain-social-housing/>

The Îlot Saint-Germain project demonstrates a successful example of the integration of historical and contemporary architecture in social housing and can serve as a model for similar projects in other cities.

#### 4.5 Buildings for Medical and Recreational Purposes

The Edinburgh Apartments & Lofts project, developed by the OAD architectural firm and located in the city of Jurmala on the Baltic Sea coast, is an example of a harmonious combination of historical context with modern architectural solutions (OAD, 2021).

The idea is to renovate a former Soviet sanatorium into affordable residential apartments. While retaining the sturdy structures of the original buildings, the project embodies the idea of recycling and rethinking existing functional uses (Fig. 8).



Figure 8: Edinburgh Apartments & Lofts project, designed by OAD. Source: <https://oad.archi/work/edinburgh>

Technological and social aspects are focused on the use of economical materials and prefabricated structures, which makes the complex accessible to families with different financial capabilities. The landscape solution includes landscaping and sports areas, stimulating the formation of a friendly community and an active lifestyle.

This is an example of successful adaptation of historical architecture of the Soviet period to current residential needs, which demonstrates a careful attitude to the cultural context of Jurmala, offering comfort, accessibility and environmental sustainability.

## 5 RESULTS AND DISCUSSION

Adaptive reuse of buildings is currently considered as an effective strategy for creating affordable housing through a comprehensive transformation of existing structures. This method involves the comprehensive integration of various factors, including:

### 5.1 Environmental and Technological Aspects

The transformation of abandoned or dilapidated buildings helps to reduce construction waste and reduce the carbon footprint by partially or completely preserving existing materials and structures. The use of energy-efficient technologies, such as improved thermal insulation and renewable energy sources, further reduces the negative impact on the environment.

In addition, modern construction technologies, including intelligent control systems and digital tools, provide increased comfort, energy efficiency, accessibility and safety of facilities, as part of the re-adaptation.

### 5.2 Social and Humanitarian Aspects

The Strategy promotes equality in society by providing affordable housing in existing urban areas and involving local communities. The participation of residents in the planning process makes it possible to take into account the needs of the population.

The transformation of buildings ensures the creation of safe housing for vulnerable groups such as refugees and low-income families, reducing their dependence on temporary shelters and facilitating integration. Thus, the strategy leads to sustainable urban development and social cohesion.

### 5.3 Cultural Aspects

Adaptive reuse of buildings is a tool for preserving the cultural identity of the urban environment. Such projects are aimed at integrating new functional typologies into the historical and modern contexts of urban planning structures, taking into account the principles of harmonious interaction.

This ensures the preservation of historical and cultural heritage, the development of infrastructure and creates a spatial environment that meets the needs of various groups of the population. The inclusion of cultural, educational and social functions in the reconstructed architectural objects of affordable housing strengthens social interaction and contributes to improving the quality of urban life.

### 5.4 Economic Aspects in the Context of the Housing Crisis

Reuse of existing buildings reduces the cost of building materials, engineering infrastructure and land resources compared to new construction. Financial instruments such as tax incentives and government support programs contribute to building adaptation projects, revitalizing abandoned areas, creating jobs, and expanding the supply of affordable housing.

With a growing population and limited resources, adaptive reuse is becoming a tool to overcome the housing crisis.

## 6 CONCLUSIONS

When forming sustainable cities, it is important to critically evaluate existing approaches to transforming the urban environment. Adaptive reuse of buildings is a way to preserve cultural heritage and create affordable housing in the context of the global housing crisis. Methodological approaches based on modern environmental and social requirements are needed to implement this practice in architecture.

It is necessary to further develop the concept of adaptive reuse as a key tool for transforming the urban environment and social interaction in the context of solving the problem of affordable housing. The methodology includes analyzing the condition of buildings, minimizing interference with original structures, developing restoration solutions taking into account the specifics of facilities, using innovative and environmentally friendly technologies, and integrating social factors.

Thus, a systematic approach to adaptive reuse of buildings to create affordable housing involves

environmental sustainability, technological innovation, socio-cultural aspects and economic efficiency, which corresponds to modern principles of sustainable development.

## ACKNOWLEDGEMENTS

The research was supported by the Russian Science Foundation Grant «Innovative approaches to modelling of fast-erecting architectural objects under conditions of multifactor risks» № 24-28-00960, <https://rscf.ru/project/24-28-00960/>

## REFERENCES

- Dave, C., 2008. Adapting an Older Building for a New Use. *Buildings Magazine*.
- Cantell, S. F., 2005. *The Adaptive Reuse of Historic Industrial Buildings: Regulation Barriers, Best Practices and Case Studies*. [Master's Thesis]. Virginia Polytechnic Institute and State University. 151 p.
- Ayumu, M. T., Ohakawa, T. C., 2023. Adaptive Reuse Financial Strategies: Converting Underutilized Commercial Properties into Affordable Housing. *International Journal of Multidisciplinary Research and Growth Evaluation*, 4(6), 1200–1206.
- Ngo, L. M., Nguyen, H. B., Nguyen, T. P. U., Nguyen, T. M. D., 2021. On Transforming Unused Urban Spaces to Social Housing for Self-Employed People in Ho Chi Minh City: An Architectural Space Design Proposal. *Sustainability*, 13(21), Article 12175. P. 1–16.
- Aydemir, A. Z., Akin, T., 2024. Adaptive Reuse of High-Rise Buildings for Housing: A Study of Istanbul Central Business District. *Urban Planning*, 9, Article 7698. P. 1–20.
- Ma, P., Li, X., Lan, D. A., 2023. Dual Strategy in the Adaptive Reuse of Industrial Heritage Buildings: The Shanghai West Bund Waterfront Refurbishment. *Buildings*, № 7, p. 1582–1595.
- Tsenkova, S., 2023. Perspective Chapter: Reimagining Affordable Housing through Adaptive Reuse of Built Heritage. In: Prof. Alessandra Battisti (Ed.), *IntechOpen*, p. 124.
- Perris, C., 2013. A “sustainable” adaptive reuse of old buildings to implement Social Housing. *Turkish Historical Review*.
- Lanz, F., Pendlebury, J., 2022. Adaptive reuse: a critical review. *The Journal of Architecture*, 27:2-3, 441-462.
- Valdiviezo, A. C., 2025. Adaptive vs. Traditional Reuse. *International Journal of Architecture, Arts and Applications* Vol. 11, No. 3, pp. 140-150.
- Cejka, J., 1995. *Trends in contemporary architecture*. Barcelona: Gustavo Gili Ed.
- Wilson, C., Carr, J., Bird, L., 2013. *The Old Vinyl Factory*, Blyth Road, Hayes. Planning Report PDU/1502d/02, Greater London Authority
- ArchDaily, 2022. From Old Chapel to Thrift Shop and Social Housing, Tectône. Available at: <https://www.archdaily.com/1004374/from-old-chapel-to-thrift-shop-and-social-housing-TECTONE> (accessed: 01 November 2025).
- Brillon, J., 2021. Spiral staircases added during Saint-Michel Nord housing renovation in Montreal. Dezeen. Available at: <https://www.dezeen.com/2021/10/27/les-habitations-saint-michel-nord-saia-barbarese-topouzanov-architectes/> (Accessed: 01 November 2025).
- Astbury, J., 2024. Parisian office blocks transformed into Ilot Saint-Germain social housing. Dezeen. URL: <https://www.dezeen.com/2024/05/03/ilot-saint-germain-social-housing/> (accessed November 1, 2025)
- OAD, 2021. *Edinburgh Apartments & Lofts*, Jurmala, Latvia. Retrieved from <https://oad.archi/work/edinburgh> (accessed November 1, 2025)