



# Corso Laurea Magistrale in ARCHITECTURE CONSTRUCTION CITY

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### The Esso Abandoned Building:

Community-Driven Adaptive Reuse of Abandoned Office Buildings in Bogotá

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## **Abstract**

This thesis explores the potential of adaptive reuse as a sustainable architectural strategy to transform abandoned office buildings in Bogotá into inclusive, community-oriented spaces. In response to the slow growing presence of obsolete mid-century office buildings particularly in consolidated urban areas like Santa Fe this research investigates how minimal architectural interventions can repurpose those structures to meet unmet social, cultural, and environmental needs.

The study adopts a mixed-methods approach combining literature review, urban and architectural analysis, and a schematic design proposal for the Esso Colombiana building that is located near Bogotá's Parque Nacional. Drawing on international and local case studies, it identifies adaptable reuse strategies and community-based functions that align with the city's sustainability goals and planning frameworks, such as the POT 2022–2035 and the Partial Plan for Urban Renewal of Sagrado Corazón.

Through the concept of the Triple Bottom Line, the thesis examines the social benefits of increased access to public amenities; the environmental gains from conserving embodied energy and reducing demolition waste; and the economic opportunities linked to revitalizing underutilized buildings. The proposed program includes a mix of cultural, recreational, educational, and commercial uses determined by the socio-economic analysis of the urban context in order to respond to the urban tissues and improve neighborhood vitality.

By prioritizing function over form and community benefit over speculation, this work demonstrates how adaptive reuse can be a replicable tool for equitable and sustainable urban transformation in Bogotá and similar Latin American contexts.

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# 1. Introduction

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## 1.1. Background and context.

In Bogotá, while abandoned office buildings are not a widespread phenomenon, certain cases stand out for the negative impact they generate in their surroundings. Once active parts of the city's economic and spatial fabric, these structures now are unused, disconnected, and underutilized. Their presence contributes to perceptions of insecurity, reduced neighborhood vitality, and missed opportunities for social, cultural, and environmental development.

Rather than allowing these spaces to deteriorate more, adaptive reuse offers an architectural and urban strategy to reintegrate them into the city's life. By transforming buildings that have lost their original function into spaces with new public or semi-public uses, Bogotá could respond to existing shortages in urban infrastructure like in cultural centers, local commerce, recreation areas, or hybrid civic programs without the high financial and ecological costs of demolition and new construction.

This thesis investigates how adaptive reuse can be implemented in Bogotá to insert low cost, high impact programs into abandoned office buildings through minimal architectural interventions. Unlike housing conversions, which often involve complex internal restructuring and regulatory adjustments, this research focuses on alternative uses that are more feasible to implement and more directly aligned with the everyday needs of surrounding communities.

Through case study analysis, design research, and the development of a concrete architectural proposal, the thesis aims to identify suitable buildings, reuse strategies, and programs that can be replicated in similar urban contexts. Doing an emphasis preserving the structural integrity of existing buildings, reducing transformation costs, and incorporating passive sustainability systems and modular or reversible components seeking for a for a building that can adapt to the changing needs of the community.

By working at the intersection of architecture, community engagement, and sustainability, this thesis seeks to demonstrate how abandoned office buildings can become active, accessible, and inclusive urban nodes contributing to wider goals of revitalization, equity, and responsible city making improving quality of life of the inhabitants.

## 1.2. Research Problem

In recent years, Bogotá has experienced a slow increase in the number of underused and abandoned office buildings, particularly those constructed in the late 20th century. Many of these buildings have become obsolete due to outdated configurations, poor energy performance, and the inability to meet contemporary functional standards. At the same time, the city faces urban challenges especially the deficit of public infrastructure and inclusive spaces that address the needs of diverse communities.

In multiple neighborhoods, there is a clear lack of facilities for education, recreation, cultural engagement, community organization, and the presence of informal economic activity. This deficit of accessible, well distributed urban infrastructure directly affects the quality of life for many residents. Meanwhile, significant portions of the built environment remain vacant, deteriorating, and disconnected from the city's evolving dynamics.

This situation presents an opportunity that is the adaptive reuse of abandoned office buildings. Instead of investing in new developments on the urban periphery which often contributes to sprawl and spatial segregation, the repurposing existing office buildings within consolidated areas could provide a more sustainable, efficient, and equitable alternative. These buildings could house collective uses such as community centers, youth or elder care facilities, educational hubs, cultural venues, or innovation labs revitalizing neglected areas and making better use of existing resources.

However, this strategy remains generally untested in Bogotá. There is limited precedent for converting office buildings to new uses like housing, and even less for developing multifunctional spaces that respond to local priorities. Challenges such as design feasibility, regulatory barriers, financing, and institutional inertia have limited the implementation of adaptive reuse as a viable urban development tool.

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## 1.2.1. Research Question

What is the potential of abandoned office buildings in Bogotá to be adapted to new uses that benefit the **community** and promote **urban sustainability**?

This question is structured around the Triple Bottom Line (TBL) framework of sustainability, which emphasizes the need to balance social equity, environmental responsibility, and economic viability in sustainable development (Elkington, 1997; Kibert, 2016).

- Social: by exploring how adaptive reuse can provide inclusive, community-centered spaces and access to essential services, the project aligns with research showing that building reuse can enhance social cohesion, preserve local identity, and support equitable access to urban amenities (Geldenhuys & Bradfield, 2020; DLR Group, 2025).
- Environmental: by minimizing demolition waste and promoting the conservation of embodied carbon, adaptive reuse supports environmentally responsible urban growth and contributes to climate mitigation, as supported by life-cycle assessments showing significant emissions savings from reuse strategies (Langston et al., 2008; Świerzawski et al., 2024; Perkins&Will, 2024).
- Economic: by reactivating vacant buildings, adaptive reuse creates employment opportunities, supports small-scale commerce, and stimulates investment in previously declining areas, making it a cost-effective strategy for urban revitalization (Kibert, 2016; Alvarez-Díaz & Villalón, 2023; UN-Habitat, 2015).

By addressing this question, the thesis aims to develop context-sensitive, inclusive, and sustainability-oriented architectural strategies that can guide urban transformation efforts in Bogotá and serve as a reference for other Latin American cities facing similar challenges of obsolescence and infrastructure inequality.

## 1.2.2. Sub-Research Questions

- 1. What types of public or semipublic functions can be integrated into abandoned office buildings in Bogotá, and how can their implementation enhance community access and engagement while ensuring feasibility, adaptive reuse principles, and urban sustainability?
- 2. What architectural features and structural considerations affect the suitability of abandoned office buildings in Bogotá for adaptive reuse with minimal intervention?
- 3. How can adaptive reuse of office buildings address specific community needs and shortages in public facilities (cultural centers, local commerce hubs, recreational spaces), promoting urban revitalization, inclusiveness, safety, and cohesion?
- 4. How does adaptive reuse in Bogotá reduce environmental impacts compared to demolition and new construction?
- 5. What passive or green architectural solutions can enhance energy efficiency and sustainability in reused office buildings?
- 6. How do Bogotá's current territorial planning laws, building codes, and territorial planning instruments influence adaptive reuse projects? Are these regulations sufficiently flexible?
- 7. What ideas from successful adaptive reuse projects in other countries could be useful for Bogotá, and how have these projects helped improve local communities and city life in those places?
- 8. How has office building abandonment impacted local communities, urban sustainability, and real estate market dynamics in Bogotá?

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## 1.3. Research Objectives

### 1.3.1. General Objetive

• To explore the potential of adaptive reuse as a sustainable strategy to transform abandoned office buildings in Bogotá into inclusive, sustainable, and community serving spaces through reduced cost architectural interventions.

## 1.3.2. Specific Objetives

- To identify the main architectural, regulatory, and contextual factors that influence the feasibility of transforming abandoned office buildings in Bogotá into community serving spaces through adaptive reuse.
- 2. To evaluate the architectural, structural, and environmental conditions of abandoned office buildings and determine how minimal intervention strategies can be effectively applied in Bogotá's urban context.
- 3. To explore how public or semipublic functions can be integrated into reused office buildings to address specific community needs and enhance accessibility, inclusivity, and neighborhood vitality.
- 4. To investigate the socio environmental and economic impacts of adaptive reuse projects, including their potential to reduce demolition waste, lower carbon emissions, stimulate neighborhood revitalization, and promote more equitable urban development in a city like Bogota.
- 5. To investigate passive, green, and nature based architectural solutions that can enhance the environmental sustainability of reused office buildings.
- To develop a programmatic and conceptual architectural proposal that responds to the identified community needs and urban conditions, demonstrating how adaptive reuse can activate abandoned office buildings through context sensitive uses and spatial strategies.

# 1.4. Scope and delimitations

This thesis explores the potential for adaptive reuse of abandoned office buildings in Bogotá to host community-oriented functions that promote urban sustainability through cost reduced architectural interventions. Rather than focusing on residential conversions which often require complex restructuring and regulatory modifications, the project concentrates on adaptable programs such as cultural spaces, educational facilities or recreational areas. These uses tend to be more feasible in the short term, require fewer physical transformations, and can offer significant contributions to local communities. The selected case study will be located in a consolidated urban zone, with particular interest in areas undergoing transformation or heritage debates, such as the downtown of Bogota. The buildings under consideration will generally belong to the mid-20th century modernist typology, often constructed in reinforced concrete and exhibiting signs of spatial obsolescence rather than structural decay. The project will remain within the schematic design phase, focusing on articulating clear spatial strategies and volumetric studies that formalize conceptual ideas into architectural language. Rather than producing construction level documentation, the project will be focused on urban analysis, early-stage design thinking, with proposals including conceptual diagrams, schematic floor plans, and volumetric designs. This research incorporates urban-based solutions, exploring how architecture can operate as a tool to support greater goals such as densification, social equity, and ecological sustainability. Passive sustainability strategies such as daylight optimization, natural ventilation, rainwater recollection, and green roofs could be integrated into the proposals as low-cost, low-tech responses to both environmental and urban needs. Even when this thesis won't go into detailed financial modeling, the thesis will aim to propose economically sustainable programs that are aware of the immediate context of surroundings economics. These will include functions with low operational costs, potential for modest income generation, or the capacity to attract public or institutional support. The economic evaluation will therefore focus on the strategic viability of adaptive reuse rather than on detailed cost-benefit analysis. The proposal will be shown by community

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needs and deficits identified through local planning instruments, such as the Plan de Ordenamiento Territorial (POT) 2022-2035. The study also respects current legal and regulatory frameworks, analyzing how these influence reuse feasibility without proposing legislative reform. In terms of limitations, the thesis will focus on a single representative building, which means its conclusions are not universally applicable to all abandoned office buildings. But the strategies developed are intended to offer replicable design principles aiming to inform future interventions within similar contexts.

# 2. State of the Art

# 2.1. Purpose and Relevance

This chapter aims to provide a theoretical and practical foundations for investigating how abandoned office buildings in Bogotá can be reused for new community-oriented functions. It was made thinking on three purposes. First, it defines the conceptual framework of adaptive reuse as a sustainable architectural and urban strategy. Second, it identifies relevant global and local precedents, challenges, and lessons. Third, it explores how adaptive reuse can support other goals like as social inclusion, environmental sustainability, and equitable urban development.

The review is structured around four main themes: global trends and definitions of adaptive reuse, sustainability dimensions, technical and economic feasibility, and community-centered outcomes. These themes respond to Bogotá's unique conditions, where the abandonment of office buildings is gradual and localize not caused by economic collapse, but by out of date spatial standards and changing functional needs.

As Bogotá integrates adaptive reuse into its planning frameworks through instruments like the POT 2022-2035 and agencies such as RenoBo, there is an urgent need to understand how underutilized office buildings can become useful again not through housing that could be complex and expensive, but through public or hybrid uses that address local deficits in infrastructure and space. This review aims to inform about that process.

# 2.2. Definitions, Concepts, and **Global Trends in Adaptive Reuse**

Adaptive reuse refers to the process of repurposing buildings that have lost their original function in order to extend their life and meet new social, economic, or environmental needs (Remøy & van der Voordt, 2009). In the field, this practice recognized as a sustainable alternative to demolition, especially in cases where buildings still maintain structural integrity but fail to meet current market demands. While the phrase originally referred to heritage preservation, it has evolved to include office buildings, industrial sites, and even commercial spaces in decline (Bullen & Love, 2011).

One important conceptual change in adaptive reuse is the move from "form follows function" to "function follows form." In this approach, existing buildings are treated as containers of spatial potential, where new programs must adapt to the physical constraints and opportunities of the structure (Zijlstra, 2022). This reversal is particularly relevant for vacant office buildings in Bogotá, where in seen abandoned cases deep floor plates, rigid service cores, or obsolete spatial standards may no longer meet office market demands, but can accommodate alternative uses if carefully studied.

Also, Remøy and van der Voordt (2009) introduced the term "functionally neutral buildings" to describe spaces designed or reimagined to accommodate multiple future uses with minimal changes. Although Bogotá's abandoned office buildings were not originally conceived this way, many can still support new functions if their structure and layout are compatible with spatial flexibility and natural light.

Globally, the adaptive reuse of office buildings has become more common due to shifting market demands. In Amsterdam, many outdated offices have been converted into creative hubs, schools, or social programs due to long-term vacancy and changes in the real estate cycle (Alexandre, 2020). In London, flexible planning policies helped transform obsolete commercial buildings into civic and cultural spaces, being part of a broader strategy to balance environmental and social sustainability goals (Barlow & Gann, 1995). In North America, Toronto and New York experienced successful waves of office to community reuse during the 1990s and 2000s, driven by financial economic crisis and urban revitalization policies (Heath, 2001; Beauregard, 2005).

While housing is often the default option for reuse in many cities programs that respond to public needs such as cultural facilities, co-working hubs, education centers, or recreation spaces are uses may be less common, but they are increasingly recognized as vital to inclusive and resilient cities (Glumac & Islam, 2020).

For Bogotá, understanding these concepts is really important to denotate reuse as a sustainable, low-carbon design strategy that aligns with urban equity and accessibility goals. So by the reuse of buildings that are no longer useful to the real estate market, cities can recover embodied energy, reactivate inactive zones, and respond to public deficits without expanding into new zones or investing in high-cost construction.

# 2.3. Sustainability Dimensions of Adaptive Reuse

The practice of adaptive reuse aligns with the principles of sustainable development as defined by the concept Triple Bottom Line (TBL) that will we taken as a reference for this thesis which has emerged as a foundational framework for evaluating the integrative impact of design interventions. Initially conceptualized by Elkington (1997) in the corporate sustainability domain, the TBL model has been adapted to guide architectural and urban practices seeking to deal with the multiple demands of environmental, social equity, and economic feasibility (Kibert, 2016; Geldenhuys & Bradfield, 2020). Its growing relevance in architecture reflects a shift toward systems thinking, where the success of a project is not only measured by its environmental performance but also by its ability to generate social and economic value in a context-sensitive manner (Langston et al., 2008).

Also, In the context of adaptive reuse, TBL shows its suitability as a guiding framework. The reuse of abandoned or underutilized buildings inherently supports environmental goals by lowering the carbon footprint of urban development (Świerzawski et al., 2024; Perkins&Will, 2024). According to Langston et al. (2008), adaptive reuse strategies allow for strategic environmental and economic assessment through their "Adaptive Reuse Potential" model, which explicitly builds on TBL indicators to evaluate reuse viability. These findings are highlighted in life-cycle studies demonstrating that building reuse can reduce global warming potential by over 80% when compared to demolition and new construction (Świerzawski et al., 2024).

About social aspects, the TBL emphasizes inclusive access to infrastructure, community identity, and social equity objectives that adaptive reuse can directly support when aligned with public or semipublic functions (DLR Group, 2025; Alvarez-Díaz & Villalón, 2023). Researchers have shown that converting buildings into community hubs such as cultural centers, educational spaces, or markets not only activates abandoned areas but also builds local cohesion and makes sure that vulnerable people benefit from urban renewal (Geldenhuys & Bradfield, 2020; Joseph, 2024). These uses are particularly relevant in Latin American cities like Bogotá, where infrastructural inequality and fragmented urban growth often limit access to civic resources (Sierra-Castañeda & Zea, 2019; UN-Habitat, 2015).

And now speaking about the economic aspects, the Triple Bottom Line promotes strategies that are cost-efficient and that can stimulate local development. Research suggests that adaptive reuse projects can significantly reduce construction costs while enabling faster delivery and job creation (Kibert, 2016; DLR Group, 2025). In Bogotá, recent programs of the municipality are targeting inner-city revitalization have focused in the cost-saving potential of adaptive reuse, especially in the rehabilitation of modernist office buildings from the mid-20th century, which are often structurally sound but functionally obsolete (Instituto Distrital de Patrimonio Cultural [IDPC], 2024).

By integrating all three previously mentioned TBL pillars, adaptive reuse emerges not only as an environmentally good solution, but also as a socially responsive and well economically planed strategy. Its application to abandoned office buildings in Bogotá aligns aligns with local efforts to create equitable, compact, and polycentric cities (Secretaría Distrital de Planeación, 2023). And, TBL offers both a theoretical perspective and an operational tool for understanding how minimal architectural interventions in obsolete urban fabric can support multidimensional sustainability goals.

# 2.3.1. Environmental Sustainability

From an environmental perspective, adaptive reuse helps reduce the carbon footprint of the built environment by conserving embodied energy and minimizing construction waste. According to Wilkinson and Reed (2008), reusing existing structures can retain up to 95% of the building's embodied energy, which would otherwise be lost during demolition and reconstruction. This makes reuse a critical strategy for cities aiming to reduce greenhouse gas emissions in the construction sector.

Office buildings, especially those built in the 1970s-1990s in Bogotá, often contain concrete frames and deep floor plates. While they could have outdated facades or inefficient energy systems, their structural cores are frequently strong and reusable. Rehabilitating them with passive systems such as solar shading, natural ventilation, or rooftop greening as demonstrated in Milan's Villoresi 13 project, things that can substantially improve energy performance without the need for major intervention (Fianchini & Ferrucci, 2018).

Rodrigues and Freire (2017) used a life-cycle assessment (LCA) model to compare retrofit strategies in Portugal, showing that reusing older buildings even with insulation upgrades results in lower total environmental impacts than new construction. This is especially important in Bogotá, where sustainability goals outlined in the POT 2022–2035 prioritize climate adaptation and reduced sprawl of the city (Secretaría Distrital de Planeación, 2022).

# 2.3.1.1. Nature-Based Solutions Complimenting Adaptive Reuse

In recent years, nature-based solutions (NBS) have become an appropriate and multifunctional strategy to help solving the environmental challenges of urbanization, especially within the built environment. In the context of architecture and urban design, NBS refers to interventions that mimic or take advantage of natural processes to deliver environmental, social, and economic benefits (Kandel & Frantzeskaki, 2024). When this practice is integrated with the adaptive reuse of existing building that is abandoned or underused office buildings these strategies creates an unique opportunity to improve sustainability, resilience, and ecological value while preserving embodied carbon and reducing the need for new construction (He, Tapia, & Reith, 2023; MBH Architects, 2023).

Since buildings use a lot of energy and cause many greenhouse gas emissions, reusing them is already a more sustainable option because it saves materials and take advantage of the already used ones. However, its potential can be significantly increased when nature-based elements such as green roofs, vegetated facades, rainwater harvesting systems, daylighting strategies, and urban biodiversity features are introduced (Kandel & Frantzeskaki, 2024). The literature found claims that mixing NBS with building reuse can transform obsolete or inefficient buildings into high-performance, climate-adaptive structures that contribute positively to urban ecosystems (He et al., 2023; Climate-ADAPT, 2023).

A systematic review done by He et al. (2023) analyzed 101 studies assessing the impact of NBS on energy demand in buildings. The authors concluded that building level NBS particularly green roofs and green facades can reduce cooling energy demand by 3% to 90%, and heating energy demand by up to 60%, depending on climate conditions and design implementation. These results underscore the potential of integrating NBS in reused buildings, where such interventions can offset the poor thermal performance common in midto-late 20th century office stock. Also, the review also notes that in mild winter climates, certain NBS (e.g., evergreen vegetation) may increase heating demand by 6% to 25%, highlighting the importance of climate-sensitive design (He et al., 2023).

Nature based interventions are also recognized for their capacity to manage stormwater in urban areas, a critical issue when updating dense, impermeable building sites. According to Climate-ADAPT (2023), green roofs, rain gardens, and permeable pavements can retain 70–95% of precipitation, lowering pressure on drainage infrastructure and improving water quality. In a project in Solana de los Barros, Spain school adaptation with green roofs, permeable pavement, and a rainwater harvesting system led to a runoff reduction from 13% to just

3% of rainfall (Climate-ADAPT, 2023). The project's integrated approach, which included automated natural ventilation and new tree planting, demonstrated the viability of NBS in existing buildings, particularly those serving educational and community functions.

Beyond energy and water performance, NBS also provide critical support to urban biodiversity and microclimate regulation. By cities are becoming increasingly sealed and fragmented, adaptive reuse projects that use green infrastructure can restore ecological connectivity. The Solana de los Barros case also recorded the spontaneous arrival of 77 animal species and 16 new plant species that wasn't part of the original planting plan evidencing that green surfaces serve as biodiversity attractors even in small, retrofitted sites (Climate-ADAPT, 2023). This is especially relevant in urban cores, where putting vegetation onto existing buildings can offset habitat loss and reintroduce native species to the cityscape.

In the Latin American context, similar benefits have been observed. Although not an adaptive reuse case, the Santalaia Building in Bogotá provides a powerful regional precedent for green facade integration. With over 3,100 m<sup>2</sup> of hydroponic gardens covering its facade and hosting more than 115,000 plants, the building can demonstrate the urban environmental impact of large scale vertical greening (IDEASS, 2016). Reports estimate that the facade removes over 2,000 tons of harmful gases and 400 kilograms of particulate matter annually an effect equivalent to taking 745 cars off the streets (Architecture Helper, 2025). The facade also offsets the carbon footprint of approximately 700 people and generates enough oxygen for 3,000 people per year, highlighting the value of green walls in urban air purification (IDEASS, 2016).

While most of the papers found center on green roofs and walls, natural daylighting strategies are also becoming important in adaptive reuse. Daylighting not only reduces electricity demand but also improves user well-being. In the retrofit of the Boston Children's Museum, a 19th-century warehouse was transformed using skylights, green roofs, and water-efficient systems to create a sustainable, healthpromoting space (BuildingGreen, 2009).

In Barcelona, the 22@ District Office Building, a reuse of an old industrial structure, demonstrates a comprehensive application of NBS, including a semi-public rooftop garden, permeable surfaces, and a vegetated double-skin facade (Oppla, n,d.). These interventions have improved both the building's energy performance and local biodiversity, and also serving as recreational and educational space for occupants. The inclusion of urban agriculture and plant species on the facade has created microhabitats that help connect larger ecological networks across the district (Nature4Cities, 2017).

All of these examples support that integrating NBS into adaptive reuse provides complementary benefits. Not only do these strategies significantly enhance

environmental sustainability just by reductions in energy and water use, but they also restore ecological functions, improve human health, and elevate the social value of reused buildings, all of this being aligned to the concept of the triple bottom line previously explained. As said by Kandel and Frantzeskaki (2024), "renaturing buildings" is a practical and symbolic way of healing cities, turning obsolete infrastructure into "living" architecture that regenerates its context.

Even with all of this previously mentioned benefits, the existing literature also identifies gaps. Most studies remain concentrated in Europe and North America, with relatively less studies done from tropical or subtropical cities in Latin America, including Colombia (He et al., 2023). Also, while several technical guides exist for designing NBS in new construction, fewer are adjusted to the constraints of existing buildings, especially office structures. Nevertheless, examples like the Santalaia facade in Bogotá, and the city's public promotion of green roof policies (Bogotá Humana, 2016), suggest a growing regional awareness of the role of nature-based retrofitting in sustainable urban transformation.

More specifically speaking about the city of Bogotá, adaptive reuse have to take into account the city's vulnerability to climate risks and the social need for inclusive infrastructure. The city experiences a mild subtropical highland climate (Köppen Cfb), the heat island effects have become more prominent due to high impermeable surface coverage and reduced vegetation in central areas. Also, recent studies indicate that urban zones in Bogotá can be from to 3 - 4 °C warmer than surrounding rural areas, especially during dry months (IDEASS, 2016). This not only raises energy demand in buildings but also exacerbates air pollution and affects human health. Addressing this issue through nature-based adaptations is an accurate solution given than is both, sustainable and a context sensitive strategy.

Responding to these challenges, the city has taken its first steps for promoting green infrastructure. As early as 2011, Bogotá's environmental authority released a technical guide for green roofs ("Guía técnica para la implementación de cubiertas verdes"), encouraging their adoption in both new and existing buildings. This initiative was reinforced in the following years with municipal investments in pilot projects, including the installation of over 13,000 m² of green roofs and green walls between 2016 and 2018 under the "Bogotá Humana" development plan (IDEASS, 2016; Architecture Helper, 2025). These kinds of actions are clearly showing an institutional awareness of how NBS can contribute to urban sustainability. But even though the integration of NBS in adaptive reuse projects, particularly in commercial or office buildings, aren't common or not documented.

It is essential to point out that there is an opportunity to fulfill the city's sustainability objectives by the reuse of its vacant buildings because, some mid-century office structures in Bogotá, typically made of concrete frames and large window surfaces, are ideal for passive retrofitting like flat roofs suitable for green roof

installation, wide curtain walls adaptable to daylighting improvements, and facade areas appropriate for vertical gardens or shading vegetation. These latent capacities are rarely utilized, as adaptive reuse policies that often focus on functional or regulatory aspects, ignoring the environmental potential of NBS (Cedeño Valdiviezo, 2023).

Given than there is a pressing social need for community-serving infrastructure, particularly in dense central areas where cultural, educational, and recreational facilities are not well distributed. Adaptive reuse supported by NBS can provide a climate-responsive, low-carbon way to fulfill this demand. As Kandel and Frantzeskaki (2024) argue, buildings must be "renatured" to support not only urban climate goals but also the human and ecological life of cities. In Bogotá, the previous is a convergence point for environmental regeneration and social reintegration.

In summary, In Bogotá where existing policies on green roofs and public greening reflect institutional support, a more robust framework or local referents of NBS are needed to connect these initiatives with strategic reuse projects. A framework like that would not only mitigate urban heat and pollution but also reactivate dormant buildings for community-oriented use, fulfilling sustainability objectives across multiple work areas.

## **2.3.1.1.1. Case Studies**

### 1. Solana de los Barros Green School – Badajoz, Spain (2021)

Source: Climate-ADAPT (2023).

Green roof system implemented in the LIFE project. Source: SingularGreen. (n.d.). LIFE Project of the European Union [Photograph]. https://www.singulargreen.com/proyecto-life/

This public school in rural Spain was retrofitted as part of the EU LIFE project myBUILDINGisGREEN to serve as a demonstrator for climate-resilient building adaptation. The intervention included multiple NBS elements: green roofs, green walls, trees, permeable pavements, natural ventilation, and rainwater harvesting. Though not an office reuse, the building exemplifies the potential of integrating green infrastructure into existing public facilities.

#### Key Interventions

- 1,990 m<sup>2</sup> of new green areas (roofs + facades)
- 452 m<sup>2</sup> of permeable pavement
- Rainwater harvesting and on-site irrigation
- Automated natural ventilation and passive cooling

#### **Environmental Outcomes**

- Green roofs reduced roof surface temperature by 5.4 °C, directly lowering indoor heat gains.
- Classrooms previously exposed to critical overheating (>30 °C) remained below 27 °C in late summer after retrofit.
- Rainwater runoff dropped from 13% to 3%, showing major improvement in stormwater retention.
- Biodiversity indicators increased with +77 insect species and +16 spontaneous plant species recorded.

#### Lesson for Bogotá

This case is usefull for similar community uses in Bogotá. The integration of multiple low-cost NBS significantly improved thermal comfort and ecological performance. Mid-century office buildings with flat roofs and broad windows have similar surfaces for these solutions.

### 2. Santalaia Vertical Garden – Bogotá, Colombia (2015)



Figure 2
Santalaia vertical garden in Bogotá, Colombia.
Source: Greenroofs.com. (n.d.). Santalaia. https://www.greenroofs.com/projects/santalaia/

Even when is not a reuse project, Santalaia is a important precedent for NBS in Bogotá's built environment. It is an 11-story residential building covered by  $3,100~\text{m}^2$  of vertical hydroponic gardens, using more than 115,000 plants. It serves as a regional example for large-scale green facades and urban environmental enhancement.

#### Key Interventions

- Full-height vegetated facade with native and adaptive species
- Integrated irrigation using treated greywater and rainwater
- Carbon offset system and passive cooling through vegetation

#### **Environmental Outcomes**

- Removes ~2,000 tons of CO<sub>2</sub> and other gases annually
- Filters ~400 kg of particulate matter per year
- Provides oxygen for ~3,000 people yearly
- Reduces internal temperatures and cuts air conditioning use

#### Lesson for Bogotá

This building demonstrates the technical and environmental feasibility of vegetated facades in Bogotá's climate. These systems could be applied to existing office buildings with large surface areas, improving air quality, thermal performance, and public visibility. Though this case was high-budget, simplified versions could be integrated into adaptive reuse for public or cultural functions.

The previous cases studies demonstrate that nature-based solutions are not only feasible but highly beneficial in adaptive reuse projects. While financial and technical capacities vary, the consistent environmental and social gains observed ranging from lower energy and water use to increased biodiversity and community satisfaction make them a strategic component in sustainable urban regeneration.

# 2.3.2. Economic Feasibility and **Technical Constraints**

Economically, adaptive reuse can be more cost-effective than demolition and new construction, especially when infrastructure already exists and only minimal interventions are required. For instance, a study in Rotterdam found that although initial investment costs can be high, long-term savings in maintenance and energy consumption make reuse financially viable (Alexandre, 2020).

But the financial success of adaptive reuse projects depends on several key factors. Buildings with flexible structural layouts such as large spans, column grids, or lightweight partitions are more adaptable and less costly to convert (Douglas, 2006). Office buildings from the mid-20th century typically have reinforced concrete or steel structures with high load capacity, making them well-suited for new uses without significant structural reinforcement. This not only saves money but also avoids complex regulatory approvals required for major alterations (Langston et al., 2008). Bogotá's older offices may have compact circulation cores, low ceiling heights, or inadequate daylighting, making some reuse strategies more complex. Facade replacements and upgrades to HVAC or fire safety systems can represent 25-30% of total retrofit costs (Mackay et al., 2009).

But adaptive reuse can become attractive through supportive planning instruments, such as those promoted by the Bogotá POT or the Empresa de Renovación y Desarrollo Urbano (RenoBo). Examples from Toronto and Amsterdam show that financial tools like tax reductions, fast-track permitting, or public-private partnerships can make reuse financially competitive (Heath, 2001; Remøy, 2010).

Technical constraints remain significant. For instance, access regulations (ramps, elevators), seismic codes, and energy certifications often require substantial redesign. But modular, reversible, or "plug-in" systems can reduce costs and construction time (Remøy & van der Voordt, 2009). In Bogotá, where low-cost solutions are essential, reducing structural intervention while improving comfort and safety is key to unlocking the economic potential of reuse.

# 2.3.3. Social and Urban Sustainability

The social dimension of adaptive reuse is especially relevant in Bogotá, where many neighborhoods don't have proper community infrastructure. Reusing office buildings to introduce civic functions such as cultural centers, co-working spaces, educational hubs, indoor recreation or even removing the fencing opening the project to the city can help improve access to services and strengthen social connections, especially in low and middle income areas.

Social sustainability refers not only to creating accessible and inclusive spaces, but also to enhancing urban vitality and safety. Vacant buildings often contribute to insecurity and urban decay (Leahy, 2017). When reused with community oriented programs, they can activate urban life, promote informal economic activity, and create better conditions for public participation.

International precedents also highlight the social value of adaptive reuse. In New York's Lower Manhattan, where more than 60 obsolete office buildings were converted into mixed use developments, increasing residential populations and activating 24-hour neighborhood life (Beauregard, 2005). In London's Docklands, adaptive reuse helped transform mono functional office districts into vibrant civic zones with public plazas, markets, and flexible event spaces (Barlow & Gann, 1995).

In Bogotá, the Calle 72 strategic planning zone and industrial corridor revitalizations led by RenoBo are already exploring similar dynamics. However, more attention

must be given to co-design, stakeholder engagement, and programming based on local needs. If communities are included in defining the new use of buildings, the outcomes tend to be more sustainable and culturally relevant.

Adaptive reuse supports social sustainability not only by saving material, but by creating new urban relationships turning forgotten office towers into shared spaces that contribute to wellbeing, inclusion, and equity.

# 2.4. Criteria for Adaptive Reuse **Feasibility**

Evaluating if an abandoned office building can be successfully adapted to a new use requires the application of feasibility criteria that consider architectural, technical, economic, regulatory, and contextual factors. Several frameworks created in Europe and North America can serve as valuable tools to assess adaptive reuse potential.

One of the most influential is the Douglas (2006) model, which categorizes buildings according to their adaptability, condition, and conversion cost, providing a matrix to determine whether reuse is viable or whether demolition is preferable. Buildings that score high in structural integrity, spatial flexibility, and location accessibility tend to have greater reuse potential.

In the Netherlands, Remøy and van der Voordt (2007) developed a checklist-based methodology that evaluates office buildings according to structural layout (e.g., column grids, building depth), façade adaptability, daylight access, fire safety, and zoning compatibility. Their "quick scan" method identifies buildings with low functional obsolescence and encourages early-stage strategic decisions before expensive interventions are made.

A similar tool is the Transformation Potential Matrix done by Geraedts and van der Voordt (2007), which gives scores to buildings using qualitative indicators across four categories: technical, functional, financial, and legal. And for instance, the presence of load carrying façades or poor access to public transport may reduce the transformation score. But on the other hand, buildings with modular layouts, replaceable façades, and open-plan floors are more adaptable.

In Bogotá, even when there is no applied local checklist, several principles can be adapted from international precedents. The POT 2022-2035 highlights criteria such as accessibility to mass transit, integration with mixed-use zoning, and alignment with public infrastructure needs (Secretaría Distrital de Planeación, 2022). So, feasibility in the Bogotá context should also consider community deficits such as lack of cultural, recreational, or educational spaces as part of the decision making process.

Also, a really important criterion is structural integrity: reused buildings must be stable and adaptable without major reinforcement. Mid-century office buildings often meet this requirement due to their modular concrete or steel frames, which were originally designed for flexibility and durability (Remøy & van der Voordt, 2009).

The spatial configuration is another key factor. Open floor plans, regular column grids, and generous floor-to-ceiling heights (typically around 3–3.5 m in office buildings) increase a building's capacity to accommodate new layouts. These features make it easier to insert community programs such as libraries, workshops, or multipurpose rooms with minimal interior demolition (Ambius, 2022).

Accessibility also matters. Buildings located near public transportation, mixed-use neighborhoods, or civic institutions are more likely to succeed in reuse projects aimed at public benefit. Their location allows for better foot traffic, user diversity, and visibility, increasing the social return of the intervention.

In addition to physical and locational characteristics, it is important to consider regulatory flexibility. Buildings located in areas with adaptable zoning laws or in partial renovation districts can more easily accommodate new functions without long legal processes (Beauregard, 2005).

# 2.5. Programmatic Compatibility and Community Fit

Beyond technical viability, adaptive reuse requires assessing whether the new functions are compatible with the building's physical and social context. A good match considers not just what can physically fit into a structure, but what functions are needed and accepted by the local community.

The concept of function follows form is useful here: rather than forcing a building to serve a completely different purpose, adaptive reuse works best when the new program fits within the spatial logic of the existing architecture (Zijlstra, 2022). For example, buildings with deep floor plates may not be ideal for housing but can function well as exhibition areas, libraries, or coworking hubs that benefit from open spaces and flexible layouts.

Community participation is also essential to define viable programs. Participatory processes—such as stakeholder meetings or needs-mapping workshops—help align proposed uses with existing social demands and avoid underutilized spaces. In Salerno (Italy), a Horizon 2020 project successfully used a learning-by-doing methodology to evaluate public needs in adaptive reuse projects, resulting in better programmatic fit and long-term impact (De Toro et al., 2021).

Finally, sustainability criteria should be inserted from the beginning. This includes not only environmental aspects like energy performance or material reuse, but also operational sustainability, such as whether the new function can be maintained over time with local resources or low-cost management structures.

# 2.6 Lessons from International Case Studies

Studying international examples of adaptive reuse offers valuable insights into transforming office buildings for community use. While each city has its own context, many projects especially in Europe and North America share strategies relevant to Bogotá. These include converting obsolete offices into cultural hubs, educational spaces, or hybrid centers, balancing preservation with transformation. Key lessons include selecting suitable buildings, defining sustainable programs, and overcoming legal or technical barriers. Many doing a minimal change for maximum community impact, focusing investment on accessibility and community value. These cases also show how design can foster inclusion and activate public life. This thesis draws from these precedents to propose strategies for reusing modernist office buildings in Bogotá, adapting global ideas to local needs and conditions.

### 1. The Electra (BC Hydro Building) – Vancouver, Canada



Figure 3
Electra building façade in downtown Vancouver.
Source: Merrick Architecture. (n.d.). Electra [Photograph]. https://merrickarch.com/work/electra/

The Electra, formerly known as the BC Hydro Building, was constructed in the 1950s and is a notable example of modernist architecture. Located in downtown Vancouver, it experienced growing vacancy rates in the 1990s due to evolving office space requirements. Rather than demolish it, developers opted for an adaptive reuse strategy to transform it into a mixed-use building.

#### **Key Factors:**

• Structural Suitability: The shallow floor plates and large windows of the building

- allowed for abundant natural light and facilitated efficient reconfiguration. These qualities minimized the need for major interior structural changes.
- Sustainability: Much of the original structure was retained, significantly reducing demolition waste and embodied energy loss. This aligned with Vancouver's green urban policies and sustainability goals.
- Architectural Integrity: The original modernist façade was preserved. Interior improvements focused on upgrading insulation and thermal performance without altering the exterior identity.
- Community Impact: The reuse brought residential and commercial functions into the city center. Retail spaces on the ground floor helped improve streetlevel vibrancy and reconnect the building with its surrounding context.

#### Outcome:

The Electra stands as a successful example of reuse that revitalized a formerly underused office building. It now hosts a mix of residential and commercial units, contributing to Vancouver's densification goals and enhancing neighborhood activity through better public interaction and new urban uses.

#### Lessons for Bogotá:

The Electra provides several lessons for Bogotá, particularly for older modernist buildings in central areas like the Edificio Esso:

- Form Follows Feasibility: The shallow floor plates were essential to enable
  natural lighting and spatial flexibility. Bogotá's abandoned offices should be
  assessed first by their internal geometry and lighting potential before deciding
  on the new uses.
- Preservation with Purpose: Maintaining architectural identity adds value.
  Many buildings in Bogotá's downtown, like Esso, have historical significance
  that could be revalued through respectful intervention, reinforcing local
  identity while making the space usable.
- Minimal Intervention, Maximum Effect: The reuse of foundational and envelope elements allowed a more sustainable and cost-efficient transformation. Bogotá's interventions could follow this strategy to avoid expensive demolitions and preserve the embodied carbon of structures.
- Activate the Ground Floor: The project's inclusion of street-level retail
  enhanced pedestrian connectivity. In Bogotá, integrating community-oriented
  programs—such as cultural centers, public libraries, or local markets—on
  ground floors can help reintegrate these buildings with their neighborhoods
  and promote urban vibrancy.
- Zoning Flexibility and Policy Support: The success in Vancouver was also linked to flexible land use and planning policies. Bogotá's recent POT reform (2022-2035) introduces similar flexibility, which should be used strategically to push forward similar urban regeneration processes with community benefit in mind



## 2. The Student Hotel – Amsterdam, Netherlands

Source: Boelens de Gruyter. (n.d.). Parooltoren & Trouwgebouw, Amsterdam [Photograph]. https://www.boelensdegruyter.nl/en/proj-

The Student Hotel Amsterdam City is a successful example of transforming an obsolete office building into a hybrid and multifunctional urban node. Originally a 1960s tower in the Wibautstraat area, the building was adapted into a facility that blends shortand long-term accommodations, co-working spaces, and cultural functions.

#### **Key Factors:**

- Programmatic Hybridization: The new program combines student housing, hotel rooms, conference/event spaces, coworking areas, gyms, and cafés. This approach not only diversified income sources but also created an active, inclusive environment for users of various backgrounds.
- Minimal Structural Alteration: The original office skeleton was preserved. Internal partitions and systems were reconfigured using lightweight, removable interventions, making the space adaptable for future changes.
- Social Vibrancy: By focusing on community events and shared services (like open kitchens, study areas, and cultural programming), the reuse model promotes informal learning and social interaction. This has become a hallmark of its branding and user engagement strategy.
- Design Flexibility: Modular furnishings, vibrant aesthetics, and a playful use of common areas made the space attractive to youth and digital nomads. These design moves did not require extensive physical reconstruction but relied on intelligent reprogramming.

#### Lesson for Bogotá:

Programmatic Flexibility: Bogotá's office buildings can benefit from nonhousing adaptive reuse by combining compatible programs such as education (training centers, libraries), commerce (cafés, pop-up retail), and culture (event spaces, co-working). This mix reduces reliance on a single user profile and

- increases resilience.
- Incremental Adaptation: Like The Student Hotel, Bogotá projects can prioritize soft interventions: movable partitions, smart furniture, and layout reconfigurations, avoiding major demolition or heavy restructuring.
- Youth-Oriented and Public Use: Given Bogotá's student population and informal creative economies, reusing buildings as youth hubs, artist residencies, or community-led innovation centers could have high social impact with limited investment.
- Catalyst for Neighborhood Regeneration: In neglected areas with potential (e.g., near San Victorino or Parkway), such reuse projects can become anchors that attract new activity without displacing existing communities aligning with inclusive sustainability goals.

# 3. Rock Spring Park Redevelopment – Montgomery, USA



Figure 5
Public space from the Rock Spring Sector Plan.
Source: Montgomery Planning. (2017, December 20). Rock Spring Sector Plan (Figure 7) [PDF]. Montgomery County Planning Department. https://montgomeryplanning.org/wp-content/uploads/2018/10/2017-Rock-Spring-Sector-Plan\_Final-Document\_WEB-compressed.pdf

Rock Spring Park is a suburban office park in Montgomery County, Maryland, that experienced high vacancy rates due to changes in office work culture and the rise of urban preferences. Originally composed of isolated, single-use office buildings surrounded by surface parking, the site lacked walkability, mixed uses, or any connection with the urban fabric. Instead of demolishing the entire complex, a strategic adaptive reuse and infill development process was initiated to reintegrate the park into the city's life.

#### **Key Factors:**

 Reprogramming of Space: The reuse strategy introduced a mix of educational institutions, co-working facilities, retail, health services, and green public spaces.
 Not all buildings were converted; instead, some were partially reused and others complemented with new low-scale volumes.

- Pedestrian-Oriented Design: One of the main interventions was to break the car-centric design. New streets, sidewalks, bike lanes, and green corridors were introduced to allow pedestrian and bicycle circulation.
- Open Green Spaces: Green areas and public gathering spaces were prioritized. Pocket parks, courtyards, and informal plazas promoted community interaction and recreational use.
- Incremental Implementation: Instead of transforming the park all at once, the project was done through phases, allowing different actors to participate and reducing investment at the beginning.

#### Lesson for Bogotá:

- Adaptation without Demolition: Rather than seeing abandoned office areas as failures, Bogotá can treat them as frameworks for urban regeneration, adding new uses and reconfiguring open spaces rather than erasing the past.
- Public Space as a tool: One of the most impactful strategies was the insertion of quality green areas and plazas. Bogotá's adaptive reuse projects could focus on improving sidewalks, connecting to parks, or adding rooftop gardens to generate public value, even with limited budget.
- Mixed-Use without Housing: Education, culture, wellness, and commercial uses can revitalize these spaces. For example, Bogotá could insert training centers, clinics, libraries into old office typologies to promote urban life comunity.
- Phased Implementation: Adaptive reuse doesn't need to be done all at once. This is ideal for Bogotá's context, where institutional support may be not so costant.

#### 4. The Lee Towers - Rotterdam, Netherlands Source: Fianchini & Ferrucci, 2018



ource: Ossip van Duivenbode. (n.d.). The Lee Towers [Photograph]. Archello. Retrieved from https://archello.com/project/the-lee-towers

The Lee Towers are three office towers built in the 1970s in the Merwe-Vierhavens (M4H) area of Rotterdam. Previously iconic part of the city's post-war growth, the buildings became empty in the 2000s due to old layouts and location disadvantages. In 2019, the towers were adaptively reused in a large-scale project that converted them into a mixed-use complex with residential units mainly microapartments and public functions like gyms, restaurants and co-working areas.

#### **Key Factors:**

- Structural: The reinforced concrete frame and regular grid made internal reconfiguration feasible. Large service cores allowed for centralized technical upgrades without massive disruption.
- Mixed-Use Layering: While upper floors were transformed into apartments, the ground and first few floors were repurposed for public and semi-public uses: fitness centers, laundromats, cafes, co-working areas, and green terraces.
- Design and Branding: The project embraced a youthful, contemporary aesthetic
  and marketed itself as a hub for students, creatives, and entrepreneurs. Public
  access to amenities like rooftop bars helped blur the line between private and
  collective space.

#### Lesson for Bogotá:

- Ground Floors Importance: The activation of ground and mezzanine levels was crucial to the success of Lee Towers. In Bogotá, even if the upper floors remain vacant or slowly phased, reusing the lower floors for public-facing programs (exhibitions, coworking, civic services) can immediately impact street life.
- Rooftop as Public Asset: Rooftop terraces in Lee Towers were turned into gyms, event spaces, and cafés. Bogotá's flat-topped office buildings can integrate rooftop parks, solar panels, or community gardens, aligning with passive green strategies and offering public amenities.
- Part of a Larger Vision: The Lee Towers project worked because it was embedded in a larger urban transformation plan. Bogotá can link its adaptive reuse projects to strategic urban planning initiatives like the POT 2022-2035 or urban regeneration corridors, ensuring institutional support and long-term continuity.

### 5. Function Follows Form Project - Netherlands

This research project explored adaptive reuse from a spatial-design perspective rather than a just economic or policy approach. The project focused on the idea that the form of an existing building should guide the selection of new functions rather than the oposite. They analyzed a variety of old office buildings, police stations, and department stores across Dutch cities, identifying how internal layouts, lighting conditions, and access points could naturally suggest suitable reuse options.

#### **Key Factors:**

 Design-First Methodology: Rather than beginning with a fixed program (e.g., "turn this into housing"), the method begins with spatial diagnosis analyzing floor depth, ceiling height, circulation cores, natural lighting, and façade permeability to let the space "suggest" its new purpose.

- Typological Mapping: Buildings were categorized into spatial types (e.g., central corridor, deep plan, perimeter block), each with corresponding recommended reuse options such as libraries, exhibition halls, innovation labs, or market spaces.
- Minimal Intervention Focus: Emphasis was placed on reuses that matched existing spatial logics and required only reversible or lightweight changes, such as modular furniture, removable partitions, or temporary installations.
- Community Co-Creation: The project involved workshops with architects, local governments, and community members, testing ideas for new functions based on actual spatial capacities not only social demand.

#### Lessons for Bogotá:

- Let the Building Guide the Program: Rather than imposing a pre-decided use (like a cultural center or coworking space), Bogotá projects should begin by analyzing spatial features such as light access, vertical circulation, and structural spans—to define what uses would naturally fit with the least modification.
- Apply Typological Reasoning: Many Bogotá office buildings from the 1950s-80s share certain typologies (e.g., linear corridors, central lobbies). Matching these to compatible uses such as studios, classrooms, libraries, or performance spaces can simplify adaptation.
- Prioritize Reversibility: Lightweight and modular interventions reduce costs and allow future re-adaptations.

## 2.7. Latinoamerican Case Studies

To complement the global outlook, it is essential to turn the focus toward Latin America, and Colombia, where urban dynamics, resource constraints, and sociopolitical conditions are different from those in high-income contexts. Exploring regional referents offers a perspective on how adaptive reuse can respond to local needs, regulatory frameworks, and community realities as the latinoamerican ones.

### 1. Espacio Odeón – Bogotá, Colombia



Interior view of the Espacio Odeón Cultural Center in Bogotá. Source: González Saavedra, L. (2015, October 8). Espacio Odeón: A case of architectural heritage recovery in Bogotá [Photograph].

Originally constructed in the late 1930s, the building was Cine Odeón, one of Bogotá's first cinemas. It got very damaged because the 1948 Bogotazo riots, leading to its closure. In 1963, it was revived asn important theater for three decades. After TPB's departure in the 1990s, the building remained abandoned until 2010, when a private initiative done by Juliana Steiner and Tatiana Rais acquired and transformed it into Espacio Odeón, a contemporary arts center, serving now as a hub for experimental art, theater, and community engagement.

#### **Key Factors:**

- New Functions: Espacio Odeón hosts art exhibitions, theater performances, workshops, and cultural events, focusing on contemporary and experimental works.
- Community Engagement: The center offers programs that encourage public participation and support emerging artists.
- Cultural Revitalization: The project aligns with broader efforts to rejuvenate Bogotá's historic center through cultural initiatives.
- Minimal Intervention: The renovation emphasized preserving existing structures and features, avoiding major alterations and modifications were designed to be reversible, allowing for future adaptability.

#### Lessons for Bogotá:

- **Private Sector:** Private initiatives can effectively drive cultural revitalization in urban centers.
- Community-Centric Programming: Engaging local communities in programming fosters inclusivity and relevance.
- Strategic Location: Revitalizing buildings in historic districts can stimulate broader urban regeneration.

# 2. Edificio Vásquez - Medellín, Colombia



Figure 8 Interior view of the restored Edificio Vásquez in Medellín. Source: Comfama. (2022, August 15). Edificio Vásquez: un viaje por la memoria y la resignificación.

Constructed between 1893 and 1895 by architect Charles Émile Carré as a commercial and residential space and got into disuse over the decades, becoming a shelter for homeless people around the 1980s. Declared a National Cultural Interest Asset in 2000, the building was restored by Comfama, a family compensation fund, and reopened in 2006 as a center for education, culture, and community services.

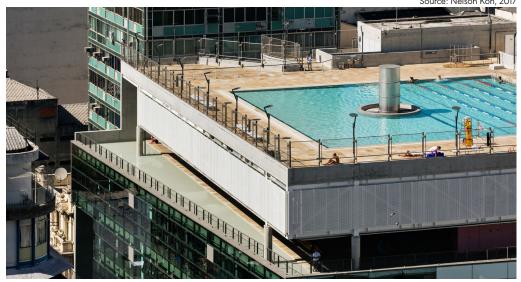
#### **Key Factors:**

- Design: The building's robust brick construction and spacious interiors allowed for adaptive reuse without significant structural alterations, and conserving architectural elements, such as the central courtyard and wooden details, preserving historical values.
- Current Use: Hosts municipal departments focused on culture and social programs, maintaining its community-oriented function. and programming decisions involved collaboration with local communities and stakeholders.
- Public-Private Partnership: The restoration was a collaborative effort between Comfama and the city, exemplifying successful public-private cooperation..

#### Lessons for Bogotá:

- Public-Private Collaboration: Partnerships between government entities and private organizations are crucial for successful adaptive reuse projects.
- Minimal Intervention Benefits: Preserving existing structures reduces environmental impact and maintains historical character and the modifications were designed to be reversible, allowing for future adaptability.
- Community-Centric Programming: Engaging local communities programming fosters inclusivity and relevance.

#### 3. SESC 24 de Maio - São Paulo, Brazil



Interior view of Sesc 24 de Maio, São Paulo Source: Kon, N. (2017). Sesc 24 de Maio / Paulo Mendes da Rocha + MMBB Arquitetos. ArchDaily.

Originally constructed in the 1960s, served as the headquarters for the Mesbla department store in downtown São Paulo. Then by the decline of the retail chain in the late 1990s, the building remained vacant for several years. And the Social Service of Commerce (SESC), a Brazilian non-profit organization, transformed the building into a cultural and recreational center. The revitalized SESC 24 de Maio opened its doors in 2017, offering a services and activities to the public.

#### **Key Factors:**

- Design Features: A central void was introduced by removing sections of the original structure, allowing for the insertion of new elements like ramps and open spaces that improve circulation and connectivity.
- New Community-centered Functions: The 14-story facility includes a theater, library, exhibition spaces, sports facilities, a dental clinic, and a rooftop swimming pool, among other amenities.
- Urban Revitalization: The project is part of broader efforts to rejuvenate São Paulo's city center by repurposing underutilized buildings for public use and is successful collaboration between non-profit organizations and architectural firms in addressing urban development challenges

#### Lessons for Bogotá:

- Minimal Intervention Benefits: Selective demolition and addition can preserve structural integrity while accommodating new uses.
- Community-Centric Programming: Engaging the community in the design and programming process ensures the space meets public needs.
- Strategic Location Utilization: Revitalizing centrally located buildings can catalyze broader urban renewal efforts.
- **Public-Private Collaboration:** Partnerships between non-profit organizations and architectural firms can successfully address urban development challenges.

# 2.8. The Bogotá Context: Urban Policies and Gaps in Research

In Bogotá, Unlike cities such as New York or London, where economic crises or market saturation have driven large-scale vacancies, Bogotá's office abandonment is more localized and gradual. This has been happening for growing differences between building supply and modern user needs. Constructed primarily in the mid to late 20th century along strategic zones like Calle 72, Chapinero, and Teusaquillo, these modernist structures often feature rigid layouts and high operating costs, making them less adaptable to contemporary office standards and contributing to their underuse.

The city faces a critical shortage of community infrastructure, including cultural centers, recreational spaces, educational facilities, and hubs for informal commerce, particularly in peripheral zones and older districts where public

investment stays behind demographic growth. Underutilized office buildings present opportunities to solve these deficits. For instance, the open-plan interiors and central locations of many mid-century office buildings make them ideal candidates for conversion into community-oriented spaces, such as multipurpose cultural hubs or local markets.

Recent urban policy has started to recognize the value of reuse. The Plan de Ordenamiento Territorial (POT) 2022-2035 explicitly encourages the adaptation of obsolete buildings to avoid unnecessary demolition and promote compact, mixed-use urban development. It promotes zoning flexibility and reuse strategies as tools for environmental sustainability and better land use (Secretaría Distrital de Planeación, 2022). In addition, RenoBo, the city's urban renewal agency, has begun identifying buildings and zones where reuse could be useful for revitalization goals.

However, Bogotá still missing a comprehensive strategy or toolkit to facilitate adaptive reuse for non-residential purposes. Existing norms aren't providing technical guides or incentives for minimal intervention reuse projects. Financial and legal frameworks for adaptive reuse are limited. Moreover, there is little empirical research on the architectural, social, and economic viability of reusing office buildings for community programs. And because of that, these buildings are often left in disuse or threatened by new constructions.

According to Stiernon et al. (2023), adaptive reuse can thrive only when there is alignment between public needs, building characteristics, and local planning tools. In Bogotá,that alignment is not too strong. While the POT offers regulatory flexibility, it does not yet guarantee implementation. Also, urban renewal initiatives often focus on large-scale, top-down strategies rather than small, distributed interventions.

The regulatory and conceptual framework guiding urban transformation in Bogotá has had an important redefinition and update with the approval of the Plan de Ordenamiento Territorial (POT) "Bogotá Reverdece 2022–2035" (Decreto Distrital 555 de 2021). This plan shows the city's commitment to sustainability, compact growth, and urban renewal using tools like partial plans (planes parciales), urban operations, and preservation mechanisms. The municipality estructured this concept by the integration of environmental considerations, transit-oriented development, and built heritage into planning practice.

According to the POT (2021), Bogotá's main corridors, particularly Carrera Séptima, are designated as critical axes for urban regeneration. The plan promotes high-density and mixed-use redevelopment in these zones to respond to housing shortages, improve infrastructure, and reduce expansion on the outskirts of the city. Also under this logic, underused or obsolete buildings are seen as opportunities for "Efficient urban land management" (Decreto 555, 2021,

arts. 66-70). The Carrera Séptima corridor, where the former Esso Colombiana S.A. building is located, is prioritized for transformation as part of the "Centro Ampliado" (amplified downtown) strategy (Secretaría Distrital de Planeación [SDP], 2021a).

One of the principal instruments the POT uses to implement this vision is the Plan Parcial de Renovación Urbana in english Partial Plan for Urban Renewal. These partial plans operate as zoning sub-frameworks, enabling the redefinition of land uses, urban form, and public obligations in specific redevelopment zones or polygons. They allow custom urban design parameters while ensuring that there is an alignment with larger planning goals. As defined in Articles 303–312 of the POT, partial plans are made specifically for central areas undergoing transformation due to obsolescence, fragmented land tenure, or underuse (Decreto 555, 2021). The Plan Parcial CAR – Universidad Libre, where the Esso building is, is a clear example of this mechanism that in this case is proposing the replacement of mid-century buildings with taller, mixed-use developments that open ground-level space and improve connections to the adjacent National Park Enrique Olaya Herrera (SDP, 2019).

The POT has an emphasis on patrimonial integration within the planning process. The VI part of the decree outlines strategies for identifying, protecting, and enhancing Bienes de Interés Cultural "Cultural Heritage Assets" (BIC). Article 422 says that when BICs are in or near renewal zones, redevelopment plans need to include specific ways to handle and blend them in (Decreto 555, 2021). Heritage isn't just a obstacle it's something valuable to build on. The thing is, lots of notable modernist buildings from the mid-1900s, like the Esso building, don't have official BIC protection, even when some experts and local groups see their worth.

This situation shows a common problem in Latin American planning: legal heritage categories often don't match up with changing ideas about cultural value (González & Rueda, 2018). The POT sees heritage as a key part of the city, but its protection methods are slow and overly bureaucratic. The process for designating heritage relies a lot on administrative decisions, and with the Esso building, lacking official BIC status meant the city couldn't easily stop its demolition (Revista Equipar, 2019).

This weakness in regulations stands out when you compare it to the case of the nearby Edificio Teusacá (once called Pan American Life), a modernist tower designed by Germán Samper. In 2019, strong public and expert support got it protected as a BIC at the district level through Resolution SCRD 718 (Consejo Distrital de Patrimonio Cultural [CDPC], 2019). But the Esso building, part of the same modernist group, didn't get this status, showing how unevenly preservation rules are applied. Experts like Beltrán and Rivera (2020) emphasize that Bogotá often treats modern heritage with less care than colonial or republican sites, leaving key buildings open to demolition.

The POT's focus on densification and private-sector involvement in renewal projects can make this difference worse. Partial plans often rely on public-private partnerships where developers get more building rights in exchange for city improvements. While this speeds up change, it can promote economic profits over heritage without strong rules or incentives. For example, Bogotá's property tax exemption program is only applied to officially recognized BICs, so buildings like the Esso, which don't have formal status, are not having financial support for adaptive reuse (IDPC, 2021).

Even with these challenges, the Esso building case shows growing awareness of the architectural and cultural importance of modernist buildings. The debate over its possible demolition discussions in the Consejo Distrital de Patrimonio Cultural, media, and academic circles, leading planning authorities to add visual corridor protections and adjust building massing in the partial plan (CDPC, 2019; SDP, 2019). Even of these steps don't ensure preservation, they are showing a move into a bigger urban identity into planning rules.

Summarizing, the policies and studies reviewed highlight the difficult balance between renewal, heritage protection, and planning incentives in Bogotá. The POT 2022-2035 sees partial plans as key for revitalizing the city center but needs better ways to protect buildings that are not under the municipality's BIC framework. Specifically, The Esso building case highlights this problems and creates questions about how urban planning can adapt to embrace more inclusive, forward-thinking approaches to heritage in fast-changing cities.

# 2.9. Gaps in Literature and **Opportunities for Contribution**

Although adaptive reuse has been widely studied in contexts such as Europe, North America, and parts of Asia, most literature focuses on the conversion of office buildings into housing, luxury apartments, or corporate campuses (Remøy & van der Voordt, 2014; Glumac & Islam, 2020). While these studies offer useful frameworks for evaluating technical feasibility and sustainability, they rarely explore how adaptive reuse could be useful for public or community-centered functions especially in Global South cities where spatial inequality, informality, and service deficits are common urban challenges.

In Bogotá, the few existing policies that mention adaptive reuse (such as the POT 2022-2035) are general and do not offer detailed criteria, incentives, or technical guidelines to support non-residential reuse at the building scale. Most urban renewal projects prioritize new development or high-budget interventions led by the public sector, with little attention to low-cost, minimal-intervention reuse strategies that can be implemented incrementally or by private owners, cooperatives, or NGOs.

Also, there is a lack of design-based research that examines how existing office buildings in Bogotá can be reimagined as flexible social infrastructure. Key questions such as how to insert community functions without major demolition while adapting building for passive sustainability are underexplored in both academic and professional literature in the mentioned context.

This thesis aims to address these gaps by developing a case-based, designoriented exploration of adaptive reuse focusing on public benefit and promotes environmental and economic feasibility. By grounding the work in Bogotá's regulatory, social, and architectural conditions, this research tries to expand the field of adaptive reuse beyond the Global North and beyond the dominant housing paradigm.

# 2.10. Summary of Key Takeaways

This literature review has explored the theoretical, environmental, economic, and social foundations of adaptive reuse, with a focus on office buildings that have become obsolete in urban contexts. International experiences from cities such as Vancouver, Milan, London, and Rotterdam demonstrate that adaptive reuse can extend a building's life cycle, reduce environmental impact, and revitalize neighborhoods, especially when aligned with local needs and supported by flexible planning frameworks.

Although most studies emphasize housing conversions, this thesis identifies a clear gap in research and practice regarding non-residential reuse for community-oriented functions. There is growing evidence that adaptive reuse can support urban equity by introducing spaces for education, culture, recreation, and public services into underserved areas. Reuse strategies that incorporate minimal intervention, modular systems, and passive sustainability techniques are particularly promising in contexts where financial resources are limited.

In Bogotá, the reuse of abandoned office buildings remains an underdeveloped practice. Despite supportive elements in the POT 2022-2035, the city lacks technical guidelines, feasibility frameworks, and a strong discourse on reuse for public benefit. This thesis contributes by addressing that void offering a local programmatic-based strategy that connects building reuse with urban sustainability and social inclusion goals.

By drawing lessons from global precedents while responding to Bogotá's specific architectural and social conditions, this research positions adaptive reuse as a tool for urban sustainability and urban innovation.

# 3. Case Study Analysis

# 3.1. Urban Context and site analysis

The Esso Colombiana S.A. building is located on the corner of Carrera Séptima and Calle 36, right in front of Parque Nacional Enrique Olaya Herrera. This is a central area in Bogotá, close to the traditional neighborhoods of Teusaquillo and La Merced. The building is part of a group of structures that were mostly built in the 1950s and 60s, when the city was expanding along Carrera Séptima. Next to it, there is another mid-century modern tower called Edificio Teusacá, and across the street lies one of Bogotá's most important parks.

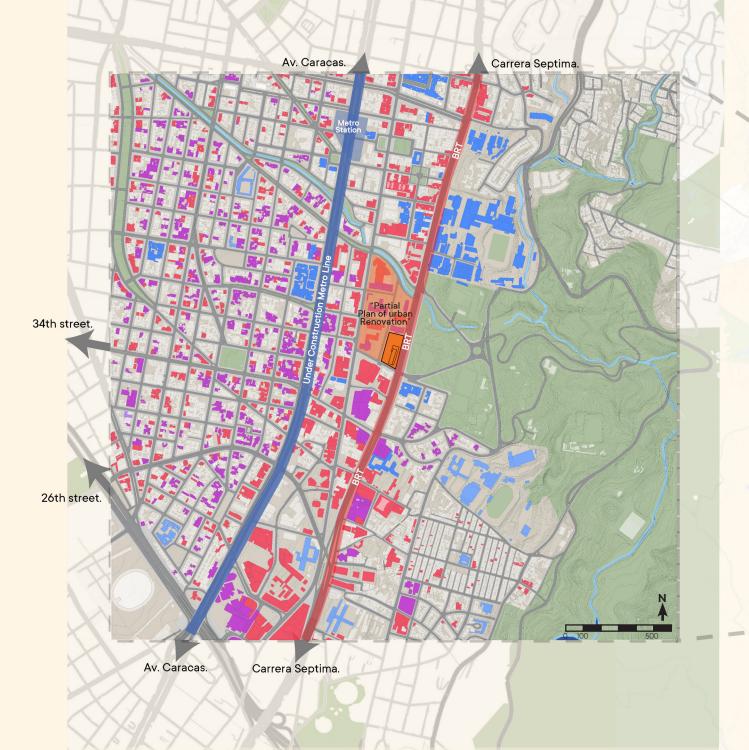
Right now, the Esso building is not being used. It has been empty for some years. Reports say this is because it does not meet today's seismic safety standards (Ortiz, 2021). Its structure is still standing, and from the outside, it keeps its modernist style, including horizontal lines and a glass façade. However, because it has no official heritage status, there is no legal reason stopping the owners from tearing it down.

This building is inside the polygon of a partial urban plan called (Plan Parcial de Renovación Urbana CAR – Universidad Libre) (Figure 10), which was approved by the city planning office in 2019. This plan covers a piece of land of almost one hectare and includes the Esso building, a parking area, and another structure owned by the university. The plan proposes building new towers for housing, offices, and commercial uses, while also creating open public space at the ground level (Secretaría Distrital de Planeación [SDP], 2019). In this context, the existing buildings – including Esso – were originally planned to be demolished.

Even though the plan encourages taller and more modern buildings, it also has rules that try to protect the quality of the urban space and the nearby park. For example, it requires that the new buildings are not too close together and that they leave space between them to allow sunlight, views, and airflow. It also asks that the visual connection between Carrera Séptima and Carrera Octava is kept open, which affects how much space can be used for building on the site (SDP, 2019). These requirements are especially important because the park across the street is a national monument and part of Bogotá's heritage.

Another important point is that the Esso building is very close to other heritage places, even if it is not a heritage building itself. To the south is the neighborhood of La Merced, which has protected houses in an English style from the early 20th century. Across the street is the Teusacá tower, which became a protected building (Bien de Interés Cultural) in 2019 after public pressure. Because of this, the plan had to include special measures to respect these surroundings. For example, new buildings are not allowed to block the view of the Teusacá tower from the park, and no new tower can cast a shadow on La Merced in the morning or afternoon (CDPC, 2019; SDP, 2019).

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At the same time, there are strong design restrictions coming from the environmental value of the area. The park in front is not only a heritage site, but also an important green space for the city. This means that any new construction must not disturb the park's light, vegetation, or visibility. In fact, city authorities asked the planners to make sure that the new buildings would respect this landscape and help improve access to the park through new pedestrian connections (IDPC, 2020).

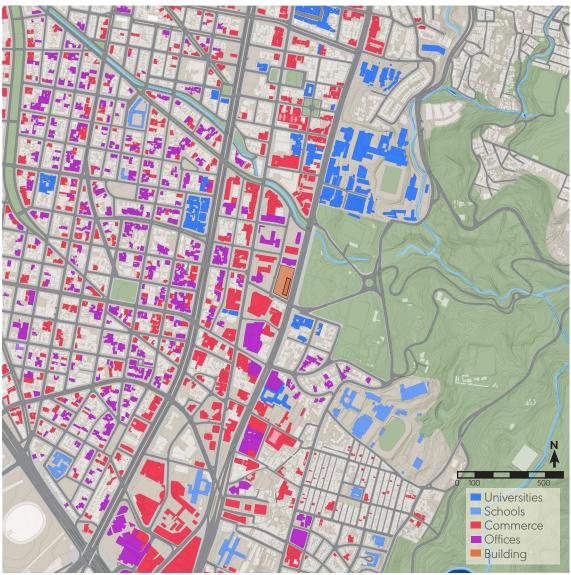
In conclusion, the location of the Esso building is very delicate, not only because it is in a central and visible part of the city, but also because it is next to heritage buildings and protected green areas. The conditions make this a special case. Even though the city's rules support redevelopment and higher density, they also require that new construction respects the cultural and environmental qualities of the site. This creates both opportunities and challenges for any project that plans to reuse or transform the Esso building.



# 3.2. Community and Territorial analysis

# 3.2.1. Location and Community Setting

The Esso building is between in a highly strategic urban fabric, next to layers of institutional, educational, and cultural infrastructure that contribute to its potential for community-oriented adaptive reuse. The Santa Fe locality is a compact, walkable zone that has historical continuity with emerging urban transformation processes. So, This mix results in a changing urban zone that has government agencies, universities, retail activities, and public green spaces as can be seen on Figure 11.



Urban Anlaysis city scale and sorrounding of the Buidling on a ratio of 1,5 Km. Source: Own Elaboration and data took from Secretaria de Planeacion.

In the east there is the Parque Nacional Enrique Olaya Herrera, a key ecological and recreational asset that is as a national monument (figure 12), which connects the built city with the Eastern Hills that is a protected ecological corridor. This park not only serves as an environmental barrier but also attracts pedestrians traffic from nearby educational institutions and offices. Also, the Carrera 7 corridor functions as a primary urban axis with a dedicated bicycle lane, several bus routes, and a feeder connection to Bogotá's TransMilenio system, facilitating sustainable transportation and regional accessibility (Secretaría Distrital de Planeación, 2020).

The land around is mainly used for institutions and mixed purposes, with government offices, school buildings, and shops alongside tall homes. This mix makes the area lively during the day, especially when people work. But at night, the place gets much quieter, causing problems with safety, lights, and keeping the area active. This change shows an

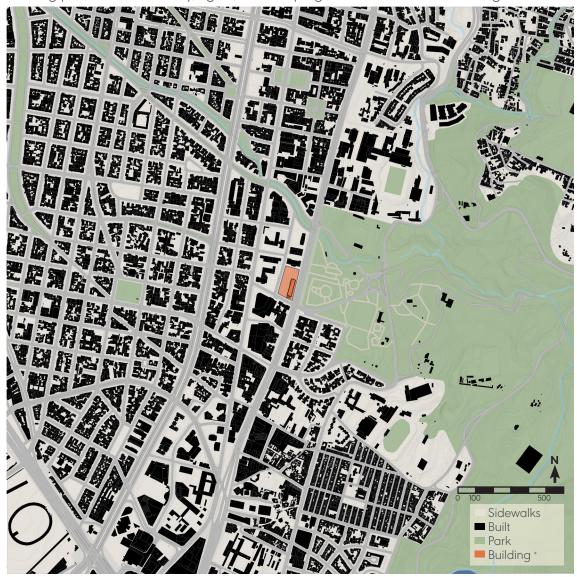


Figure 12
Urban Anlaysis city scale and sorrounding of the Buidling on a ratio of 1,5 Km.
Source: Own Elaboration and data took from Secretaria de Planeacion.

empty city space after work hours, which can be fixed through a programmatic strategy promoting inclusive, public-oriented programs that extend activity into the evening.

From a spatial perspective, the area exhibits both strengths and limitations. On one hand, the existing street infrastructure, centrality, and proximity to knowledge and cultural institutions present clear opportunities for social and educational reuse. On the other hand, urban fragmentation, blank façades, and inactive ground floors especially on the eastern side of Carrera 7 reduce the permeability and vibrancy of the pedestrian experience. Planned interventions such as the pedestrianization of Calle 37 and the underground routing of Carrera 8 are expected to mitigate these limitations and further reinforce the area's suitability for reactivation through minimal yet targeted architectural interventions (Secretaría Distrital de Planeación, 2020; Largacha Martínez, 2022).

# 3.2.2. Population and Density

#### Daily Foot Traffic by User Type

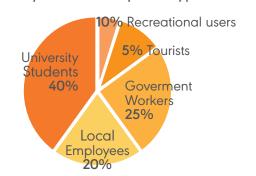


Figure 13
Source: Estimated from contextual description and institutional surroundings; qualitative estimation based on nearby land use and flow mentioned in Secretaría Distrital de Planeación (2020) and Gestión ARC S.A.S. (2019)

#### Population Density (hab/ha)

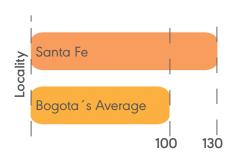


Figure 14
Graph comparing the density of the Locality and the average density of the whole city.
Source: Secretaría Distrital de Planeación (2020).

The Santa Fe locality, which includes the Sagrado Corazón UPZ, had an estimated 91,100 residents as of 2019, spread over just 651 urban hectares, resulting in a high population density of approximately 13,500 inhabitants per square kilometer (Secretaría Distrital de Planeación, 2020). This density is among the highest in Bogotá and reflects the area's central location and historical development pattern based on compact, vertical land use.

Despite this density, recent demographic trends show a declining residential population, attributed to the aging of buildings, a limited housing supply compliant with current structural codes, and a gradual shift of economic activity toward more dynamic zones. This population decline contributes to a fragmented social fabric, where many buildings remain underutilized or vacant, particularly those with outdated office layouts no longer suited to modern commercial needs (Secretaría Distrital de Planeación, 2020).

This paradox high density with reduced residential vitality creates a significant opportunity for adaptive reuse strategies that reactivate these buildings with non-

residential functions serving both local needs and transient populations such as students, workers, and visitors. In this sense, reprogramming vacant office infrastructure toward community-serving uses can support urban sustainability goals without displacing residents, helping to rebalance the mix of services and resurrect declining blocks through minimal architectural intervention.

Additionally, the site's location within a densely institutional and student-populated environment reinforces the need for inclusive spaces that offer access to culture, education, recreation, and support services, rather than additional housing units as affordable coworking spaces or public study areas. A well-planned reuse proposal would help absorb functional demand without altering the area's socio-demographic structure, supporting Bogotá's goals of revitalizing its center through sustainable and context-sensitive urban redevelopment.

# 3.2.3. Age and Socioeconomic Composition

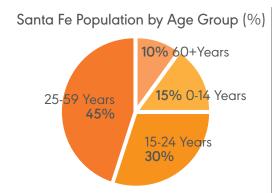


Figure 15 Estimated from Secretaría Distrital de Planeación (2020), page with age distribution 2016–2020. Source: Secretaría Distrital de Planeación (2020).

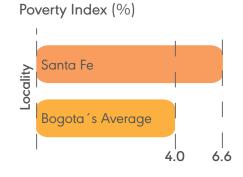


Figure 14
Bar chart comparing Multidimensional Poverty Index
Source: Secretaría Distrital de Planeación (2020).

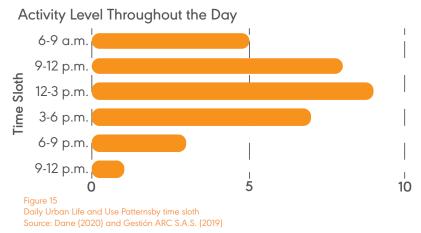
The demographic structure of the Santa Fe locality is shaped by its central location and institutional land uses, resulting in a population primarily composed of working-age adults (20–60 years) and university students, with lower proportions of children and elderly residents compared to Bogotá's average. This reflects a transient and mobile population, many of whom commute daily for study, work, or administrative purposes, and contributes to the daytime vitality but also the evening-time emptiness observed in the area (Secretaría Distrital de Planeación, 2020).

In terms of socioeconomic status, Santa Fe presents a mixed-income profile, with a predominance of low- to middle-income households. As of 2017, the multidimensional poverty index was 6.6%, putting it in the top six localities in Bogotá with higher vulnerability levels (Secretaría Distrital de Planeación, 2020). These figures suggest that while some segments of the population have stable economic conditions particularly those linked to public employment or the education sector there are also communities exposed to economic instability, limited access to services, and spatial exclusion.

The educational level in the area is relatively high among the 15-24 age group, especially due to the presence of nearby universities. This dynamic provides a knowledge-intensive environment, which creates demand for spaces beyond formal classrooms such as places for cultural programming, public study areas, community services, or low-cost dining and entertainment alternatives.

Overall, the demographic and economic profile of the Sagrado Corazón area supports the case for adaptive reuse strategies that prioritize social inclusion, educational accessibility, and economic opportunity. Integrating programmatic functions that serve low-income users, students, and working professionals such as coworking centers, cultural venues, or community hubs can directly respond to these needs, while also reducing inequality in access to central urban amenities improving the conditions for community making.

# 3.2.4. Daily Urban Life and Use Patterns



The urban dynamics in the area surrounding the Esso building are characterized by a clear contrast between active daytime use and low evening activity. During business hours, the streets see moderate to high pedestrian flows, primarily composed of university students, office workers, and visitors to nearby institutions like the Ministry of Environment and the Pontificia Universidad Javeriana. Ground-level commercial establishments, such as bookstores, banks, and cafés, generate street activity during these hours and provide informal social spaces for temporary users (Secretaría Distrital de Planeación, 2020; Gestión ARC S.A.S., 2019).

However, after office hours, the character of the neighborhood shifts significantly. Many surrounding buildings are either closed or only partially occupied, and the lack of residential density and nightlife offerings leads to a noticeable decline in public presence. This reduction in use, combined with limited street lighting and inactive façades, contributes to perceptions of insecurity, particularly along Carrera 7 and side streets like Calle 36 and 37 (Secretaría Distrital de Planeación, 2020; Gestión ARC S.A.S., 2019).

This temporal imbalance in urban life points to a spatial and programmatic gap. While the daytime environment supports circulation and commerce, the absence of inclusive evening and nighttime programs difficults the full activation of public space. The site has the potential for introducing functions that extend use beyond office hours such as educational workshops, exhibitions, cultural events, or shared community services helping to increase safety, promote civic engagement, and ensure continuous vitality throughout the day.

A reuse proposal that encourages public or semi-public functions with extended operational hours would not only support the urban regeneration goals of the partial plan (PPRU Sagrado Corazón), but also contribute to creating a more balanced and resilient central neighborhood.

# 3.3. Technical Analisys.

3.3.1. Structural System Analysis

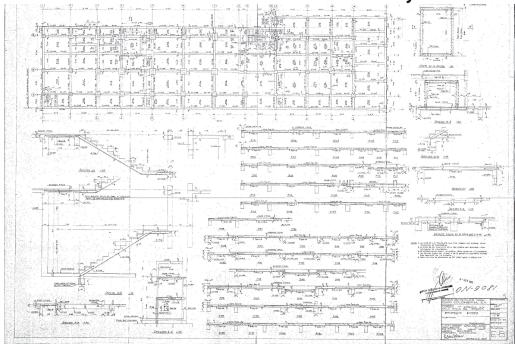


Figure 16 Original Structural Plans Source: Dane (2020) and Gestión ARC S.A.S. (2019)

The building, completed in the early 1950s, is a mid-century modernist structure with a regular steel frame and reinforced concrete elements, consistent with the construction methods of the era. According to site documentation and visual inspection reports, the building's load-bearing structure is based on steel columns and beams with a repetitive modular grid as seen on Figure 15, offering wide spans and open-plan interiors an advantage for interior flexibility during adaptive reuse (Largacha Martínez, 2022).

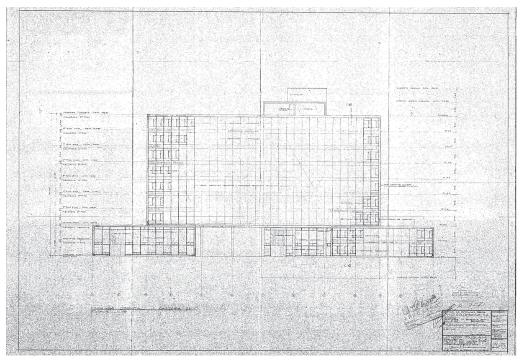
Although the original structural system provided robustness and adaptability, the building does not comply with Colombia's current seismic resistance standards (NSR-10).

This lack of compliance is one of the main reasons for its abandonment, as identified in the Plan Parcial de Renovación Urbana Sagrado Corazón (Gestión ARC S.A.S., 2019). Despite this, the structure is not in a state of failure or high deterioration, and no major deformations or foundational issues have been reported.

According to regulations and technical studies, localized structural reinforcement particularly in vertical connections and floor diaphragms would be required to enable its safe reuse. However, the general condition allows for partial retrofitting, avoiding demolition and preserving its historical and material value. This scenario is ideal for minimal intervention strategies, prioritizing internal reconfiguration without altering the primary skeleton.

In addition, the regularity of the structural grid facilitates potential adaptations for community and institutional functions, such as cultural halls, exhibition areas, or educational spaces, which typically require flexible open spans and accessible vertical circulation.

### 3.3.2 Façade and Envelope Condition



Original Western Façade View Source: Dane (2020) and Gestión ARC S.A.S. (2019)

The building's facade reflects the principles of modernist architecture typical of mid-20th century office design, characterized by horizontal strip windows, clean lines, and a modular grid expressed on the exterior as seen on Figure 17. It features glass and metal elements framed by concrete, with minimal ornamentation, prioritizing function and daylight penetration. Although time has affected the material finishes, the overall façade remains structurally intact, retaining most of its original architectural identity (Largacha Martínez, 2022).

However, the envelope shows moderate physical deterioration. Specific issues include oxidation in metal window frames, sealant degradation, and superficial damage to exposed concrete panels. These issues do not compromise the overall structural safety but do affect thermal performance, water tightness, and energy efficiency. The building also lacks insulation and does not comply with current standards for natural ventilation or passive energy behavior, limiting comfort and sustainability unless addressed during intervention (Gestión ARC S.A.S., 2019).

Despite these limitations, the façade offers high reuse potential. The horizontal window bands allow for excellent daylight access, which can be optimized with modern glazing technologies. The rhythm of the façade also allows the integration of green interventions, such as vertical gardens or external shading devices, without altering the historical reading of the building. These upgrades could significantly improve indoor climate conditions, reduce energy consumption, and contribute to Bogotá's broader goals of climate resilience and environmental retrofitting (IDPC, 2020; Secretaría Distrital de Planeación, 2022). In this context, the design proposal should focus on non-invasive upgrades, such as removable solar shading systems and green modules.



Figure 18 Photography Western Façade View Source: Gestión ARC S.A.S. (2019)

# 4. Proposal

# 4.1 Concept

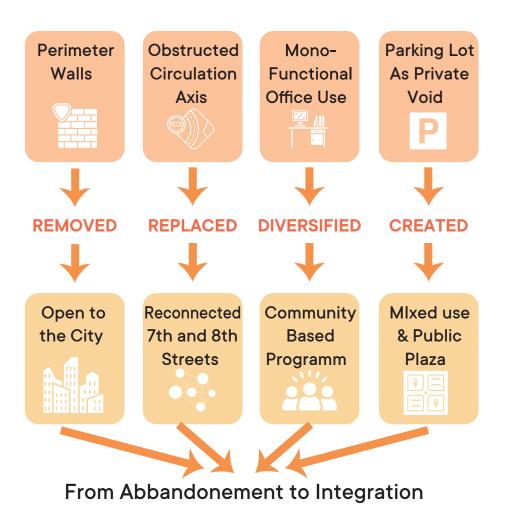


Figure 19
Conceptual Diagram

The proposed design for the adaptive reuse of the Esso Colombiana building in Bogotá is based in the principle of minimal intervention, recognizing that the optimal approach to sustainability and community engagement often involves carefully preserving and activating existing spatial conditions rather than pursuing extensive alterations. The project moves from prioritizing architectural or historical preservation as a primary objective but instead seeks to leverage existing conditions to create valuable urban spaces cost-effectively, and naturally fostering community appropriation and belonging.



Figure 20 Axonometric view of Concepts. Source: Own elaboration

A main thing to the proposal is the restoration of the building's original circulation axis that historically connected Carrera 7 and Carrera 8, improving visual permeability and physical accessibility. The intervention removes an added section that currently obstructs this essential and original connection, restoring the initial condition which could restore pedestrian movement and generates new visual corridors through the site as is shown in Figure 19. This strategy improves functional connectivity and public perception, promoting an open and inviting atmosphere and improving the integration of the building into the urban fabric.

For solving the building's ground level, the removal of the existing perimeter walls surrounding the parking area transforms this not used space into a lively, accessible, and multifunctional public square. Contrary to more invasive approaches, no significant structural alterations or interior wall demolitions within the building itself are proposed. So, the perimeter walls that isolate the parking from the street are removed, creating an open plaza that naturally atracts pedestrian traffic from the surrounding area. This new public space aims to support diverse activities commerce, leisure, cultural events, and community gatherings attracting a wide range of users throughout the day and into the evening.

This newly created public square will integrate urban furniture, better lighting, landscaping, and versatile commercial modules that activate the space, promoting safety because of increased activity and promoting a strong sense of community ownership. The programmatic diversity and spatial flexibility proposed aims that the plaza serves various demographic groups, addressing local needs and catalyzing urban revitalization.

At its core, the design concept emphasizes cost-effective reuse and practical interventions. By retaining the existing building structure, façade, and primary spatial configurations, the project reduces construction waste, reduces financial investment, and preserves embodied carbon. These decisions align closely with contemporary principles of urban sustainability, demonstrating how adaptive reuse can effectively balance environmental responsibility with social inclusivity and economic feasibility.

This proposal transforms the currently vacant Esso building and its surrounding lot into a dynamic community asset, actively contributing to Bogotá's urban renewal objectives and setting a precedent for the sustainable reactivation of similar spaces in the city.

### 4.1.1 Guiding Design Concepts

The adaptive reuse strategy for the Esso Colombiana building comes from minimal intervention philosophy aligns with urban sustainability, focusing on resource conservation and ecological sensitivity. By maintaining the existing structural configuration and façade motivated by environmental and economic concerns shows that sustainability is as important for management and practical efficiency as it is about innovative technological solutions.

So by respecting and improving what already exists, the building will create a stronger emotional and cultural connection with its users, Promoting a deeper sense of belonging and gathering for the community. The project's focus on demonstrate how adaptive reuse can economically revitalize urban areas while maintaining their identity and historical continuity.

Additionally, the project incorporates the concept of "function follows form," that says that existing structures caractheristics that can accommodate new uses effectively without a lot of changes. The internal disposition and structural logic of the existing building guide the programmatic decisions letting the building allow flexible and versatile uses that respond directly to identified community needs without the need of doing big modifications. By utilizing existing spatial characteristics, the adaptive reuse proposal promotes integration, creativity, and efficiency in solving problematics found and also by using that concept it creates the concept of "Reuse Follows Community" making reference to how the community needs have to shape the programmatic selection of the project.

### Community-Driven Reuse of an Office Building in Bogotá 60

In addition, integrating Nature-Based Solutions (NBS), like rooftop gardens and urban agriculture, into the adaptive strategy represents a commitment to ecological urbanism a pilar of the triple bottom line concept. So these measures not only are included because of environmental aspect for reducing urban heat island effects or contributing to biodiversity but they also added because they have the potential to strengthen the community's sense of ownership by inviting active participation in sustainable practices making also part of the programmatic proper selection.

The adaptive strategy proposed for the building wants to maximize its existing conditions, taking advantage of existing spatial qualities and reducing structural alterations to create a multifunctional and community-centered facility. Rather than having reuse as an architectural reconstruction, the idea is to focus on pragmatic interventions and strategic programming that directly respond to community needs, sustainability criteria, and urban integration.

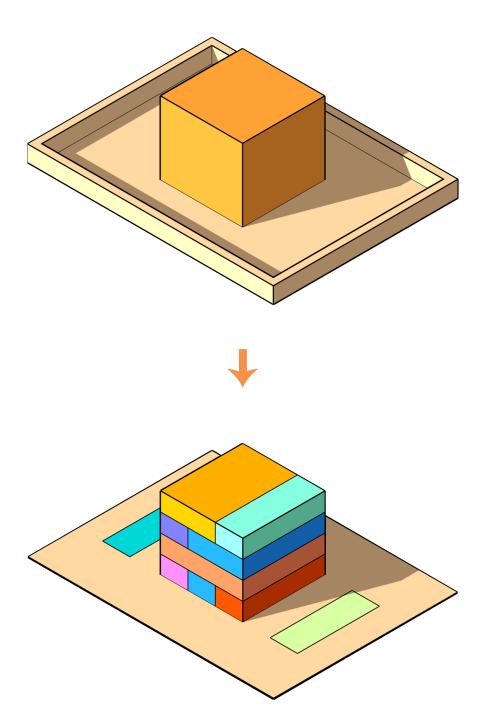


Figure 21 Axonometric Abstract Representation of the Programm. Source: Own elaboration

### 4.2.1 Functional Program Scenario

The building's functional program was carefully designed based on the outcomes of detailed urban and community analyses, which identified specific deficits in local infrastructure particularly in cultural spaces, accessible commercial units, educational facilities, and recreational areas. The programmatic proposal aims to locate the uses strategically on each of the floors, balancing public accessibility, spatial flexibility, and operational efficiency, including:

- Ground Floor (Public Interaction and Commerce): Reception and information desk, café with take-away counter, small market, public restrooms, bookstore and cultural shop, and stores. This in order to activate street-level interactions, bringing diverse commercial opportunities, and maintains a vibrant and accessible urban interface throughout the day and night.
- First Floor: Expanded stores and printing/stationery services, thought for visitors, universities and local businesses.
- Second Floor: Multipurpose community room and terraces, providing flexible space for meetings, events, and community workshops.
- Third Floor: Coworking spaces and reading rooms, supporting local entrepreneurs, remote workers, and students from nearby universities.
- Fourth Floor: Art and design coworking studios, along with creative labs, fostering creative collaboration and innovation in the arts and design sectors.
- Fifth Floor: Multimedia labs and computer labs, addressing a critical need for technological infrastructure and digital literacy in the community.
- Sixth Floor: Indoor gym, dance studios, and spaces for cultural workshops, promoting health, well-being, and cultural participation.
- Seventh Floor: Arts and crafts workshop rooms and additional activity rooms, providing opportunities for skill-building and creativity among different community groups.
- Eighth Floor: Gallery and exhibition space, offering local artists a prominent venue and enriching the cultural landscape of the neighborhood.
- Ninth Floor: Urban community garden, promoting sustainability, environmental education, community involvement, and food production.
- Outdoor/Public Space (Ground Level Extension): Open-air theater, bike repair and storage station, commerce kiosks, outdoor gym, workshops areas, and recycling station, significantly expanding public amenities and creating a lively and engaging community plaza.

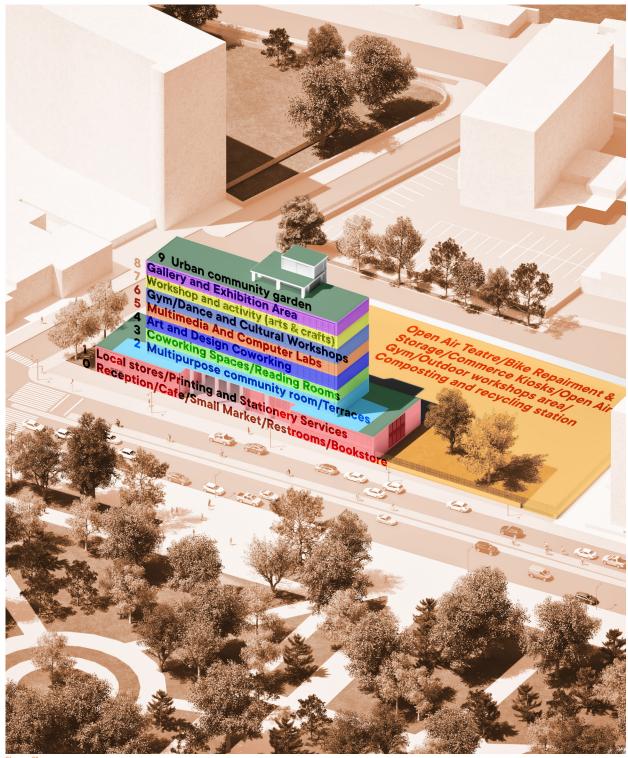


Figure 21 Axonometric Representation of the Programm. Source: Own elaboration

To promote sustainability, cost-effectiveness, and practical feasibility, the proposed adaptive strategy integrates several key sustainability measures:

- Minimal Structural Intervention: The existing structural integrity is preserved, focusing exclusively on necessary reinforcement and safety enhancements rather than extensive renovations. so in this way the project reduces environmental impact, conserves resources, and significantly decreases project costs.
- Facade Conservation and Retrofitting: The original facade will be restored, incorporating only strategic retrofitting and maintenance to enhance energy efficiency, thermal comfort, and visual quality without sacrificing architectural integrity.
- Nature-Based Solutions (NBS) as Programmatic tool for urban sustainability:
   The integration of rooftop gardens, rain gardens, and urban agriculture not only improves ecological performance and reduces operational costs but also creates inviting communal spaces for environmental education and interaction.

# 4.3 Spatial Organization and Function Program

#### 4.3.1 Ground Floor Public Interface

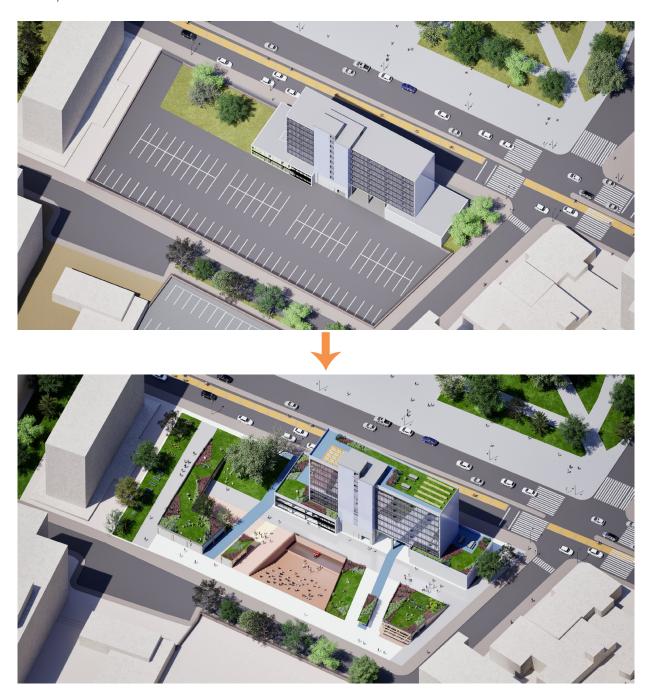
The ground floor is designed to be a dynamic, accessible, and inviting public interface. Removing the perimeter walls around the existing parking lot opens this isolated area into a big urban plaza creating a continuous pedestrian connection between Carrera 7 and Carrera 8, enhancing circulation, visual connection, and social interaction because there will be community thought uses implanted on it in order to attract pedestrians and neighbors.

Key components of the ground floor public propose are:

- Reception and Information Desk: Centrally located, welcoming visitors, providing clear orientation, and promoting easy accessibility to upper floors and public amenities.
- Café and Take-away Counter: Positioned near pedestrian entry points to animate the plaza and encourage extended usage of the space throughout the day.
- Small Market and Local Retail Stores: Designed as modular and adaptable commercial units, these spaces provide local entrepreneurs affordable locals to sell their products, benefiting local commerce, generating employment, and bringing pedestrian flow.
- **Public Restrooms:** Easily accessible, for visitor comfort and extended usage of the public plaza and internal spaces.
- Bookstore and Cultural Shop: Offering a blend of cultural products, educational resources, and locally elaborated items, enhancing the plaza's role as a vibrant

cultural and commercial hub.

The organization of these ground-floor uses prioritizes visual transparency and permeability, with extensive glazing and open entrances to encourage pedestrian engagement and enhance security using continuous visibility and activity.



Axonometric Comparison Between Current and Proposed Design.
Source: Own elaboration

# 4.3.2 Program in Upper Floors

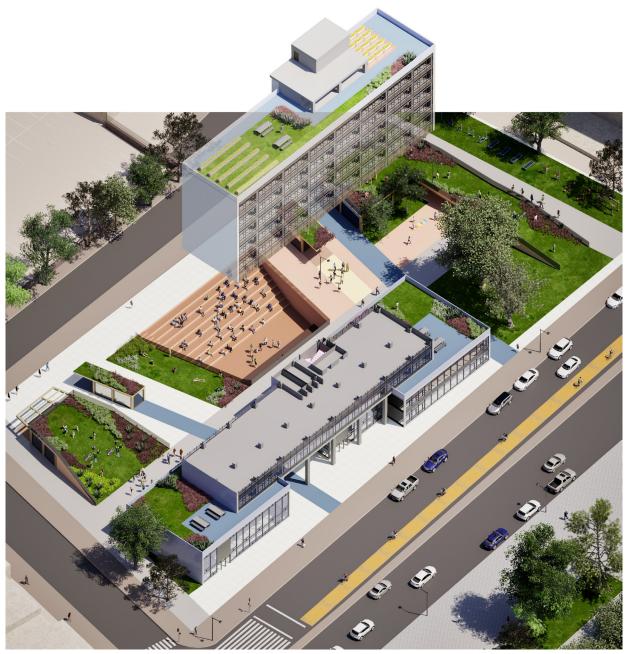


Figure 23
Axonometric Section Locating Program in Upper Floors.
Source: Own elaboration

The intermediate and upper floors of the building house diverse communityoriented uses, organized vertically to facilitate clear programmatic zoning and efficient circulation, aligned with identified community needs and sustainability principles:

• Intermediate Floors (Floors 1 to 8):Each floor has distinct programmatic groups:

- Floors 1 and 2 (Commercial and Community Uses): Additional retail, printing services, multipurpose rooms, and terraces. These floors create active communal environments adaptable for workshops, meetings, community gatherings, and small-scale events.
- Floors 3 and 4 (Coworking and Creative Spaces): Coworking areas, reading rooms, creative labs, and studios for collaboration, innovation, entrepreneurship, and cultural engagement, for students, freelancers, creative professionals, and the broader community.
- Floor 5 (Multimedia and Technology Labs): Supporting digital services, technological innovation, and community education, these spaces solve a demand for accessible technological infrastructure.
- Floor 6 (Health and Cultural Workshops): Indoor gym, dance studios, and workshop spaces, Promoting physical activity, and cultural expression among residents and visitors.
- Floor 7 (Arts, Crafts, and Activity Rooms): Dedicated rooms support community organized activities, skills training, creative hobbies, and recreational engagement, For diverse age groups and interests.
- Floor 8 (Gallery and Exhibition Space): This open plan gallery provides a space for local artists, creative collectives, and cultural events, improving neighborhood cultural identity and visibility.
- Rooftop Design (Floor 9): The rooftop area is organized to have urban agriculture and community gardens. Utilizing lightweight green roof systems, this space promotes environmental sustainability, food production, community engagement, and biodiversity enhancement, is like an accessible green oasis, promoting ecological education, leisure, and active participation in sustainable urban agriculture practices.

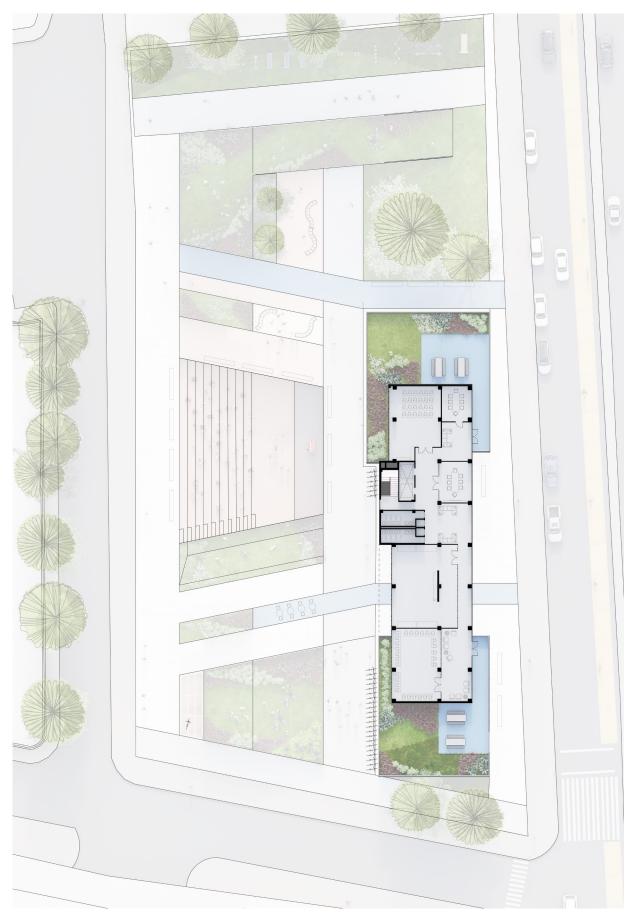
So, The spatial distribution of the program proposal looks for creating a sustainable urban facility that tries to solve local community needs, revitalizing this city zone and leaving behind the abandonement and problematics related to it creating also a replicable example for adaptive reuse in Bogotá.

# **Ground Floor**

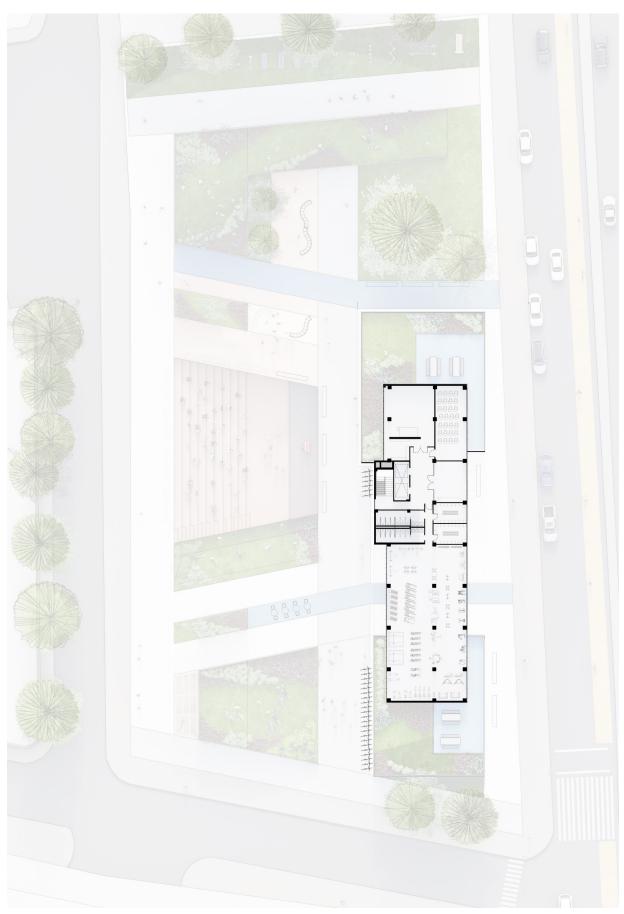
# 1:600



Floor 2 1:600



Floor 6 1:600



# 5.Discussion

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## **5.1 Cross-Referencing Case**

## 5.1.1 Comparative Analysis of Global and Local Findings

The adaptive reuse proposal for the Esso Colombiana building is done from a critical review and synthesis of international and local case studies, literature, and multidisciplinary sustainability frameworks. This section identifies patterns, contrasts, and lessons gave form to the proposal's design and strategic direction comparing successful precedents across diverse contexts. the proposal's design.

In the case of the Global adaptive reuse projects seen like the Function Follows Form Project in the Netherlands and the 22@ District in Barcelona show how outdated office buildings can be reactivated with community-driven programming and minimal architectural interventions. In these cases, the reuse strategy focused on not changing existing structural elements, integrating creative and cultural programs, and improving urban connectivity. For example, the Function Follows Form project successfully utilized existing structural conditions to have multifunctional community spaces with low-impact interventions, a concept that was important as an example for the proposal in the Esso building.

In addition, sustainability strategies were so integrated into the architectural language and urban planeation of these projects. In Solana de los Barros Green School (Spain), for example, Nature-Based Solutions were not just passive systems but active components of the learning environment. These examples confirm the importance of focusing on the functions od the building and the needs of the context and preserving the essence of the original building making it also ideal for social and environmental objectives.

In the Bogotá context, seen examples like Espacio Odeón demonstrate the adaptive reuse potential of mid-century buildings. Espacio Odeón, originally a cinema, was transformed into a cultural space with minimal structural interventions, emphasizing programming and temporary installations rather than permanent redesign, But the project was done by a private and its accessibility show the importance of having more financial and spatial inclusivity elements integrated into the adaptive reuse projects.

For syntetising what was found in global and local case studies, the Esso Colombiana proposal synthesizes are these four PRINCIPLES:

- 1. Minimalism as Method Efficient reuse strategies are based more on programming and intelligent spatial use than on architectural transformation.
- 2. Sustainability as Program Environmental strategies are most effective when are planned for the user experience (e.g. gardens, agriculture).
- 3. Accessibility as Equity Universal access and ground floor activation are necessary for community oriented reuse in Latin American contexts because of the needs of the communities and the socioeconomic chracteristics of the citizens of a citie like Bogota.
- 4. Economy as Urban Strategy A hybrid program that combines commerce, culture, and civic services provides resilience and wider public benefit.

By using these principles, the Esso building project becomes not just a design, but a contextual synthesis adjusted to Bogotá's socio-spatial dynamics, market conditions, and sustainability challenges.

## 5.1.2 Lessons Learned for Bogotá Context

The review and comparison of adaptive reuse case studies from global and local contexts give important lessons applicable to Bogotá's urban conditions. International projects offer innovative and sustainability strategies and its conceptual connection to Bogotá requires a process of adaptation to the realities of urban inequality, regulatory fragmentation, and community needs seen in the next way:

- 1. Strategic Minimalism Matches Bogotá's Economic Constraints:International cases show that adaptive reuse does not require large budgets or sophisticated technology to function. Given that in Bogotá public funding for architectural interventions is not usual and private investors often prioritize high-return developments, a non so trasnfromative reuse model becomes an accurate solution so the proposal demonstrates how small scale or reversible interventions like restoring circulation routes, removing perimeter walls, and reprogramming existing spaces as the parking lot can generate significant urban and social value without a big financial investment.
- 2. Programmatic Diversity: One probable mistake in Bogotá's reuse projects has been the concentration of single use programs (e.g. cultural-only or educationalonly projects), making the project will bu unused in certain hours or days. Thats why the Esso building uses programmatic layering: combining coworking, commerce, culture, recreation, and agriculture across vertical levels. This lesson taken from successful examples like the Student Hotel in the Netherlands or the 22@ District in Barcelona makes the building has continuous activity.
- 3. Community Gathering Through Everyday Uses: Some adaptive reuse projects have problem connecting to local dynamics when they prioritize programming or institutional agendas disconnected from neighborhood needs. This ican been

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seen in parts of La Candelaria, where cultural buildings serve tourists or elite users rather than surrounding residents. So teh proposal looked for everyday community uses and infrastructure usefull as printing shops, markets, gyms, gardens ensuring the building responds to daily routines, not some occasional events.

- 4. Nature-Based Solutions Must Be Culturally Situated: While green roofs, rain gardens, and vertical vegetation are effective ecologically, international projects often integrate them as design trends or technical systems. In Bogotá, the success of Nature-Based Solutions depends on their integration into social life and urban routines. The Esso proposal achieves this by embedding gardens within the functional program turning rooftops into spaces for urban agriculture, leisure, and learning.
- 5. Regulatory Flexibility Is Essential: One of the biggest obstacles for adaptive reuse in Bogotá is regulatory felxibility especially heritage norms, land-use limitations, and safety codes not adapted to reuse processes. International cases usually came from supportive planning frameworks or pilot policies. In the Esso building's case, its lack of heritage listing provides an opportunity: it allows more freedom in programming and interventions so is evident that Bogotá's urban policy must evolve to recognize adaptive reuse as a distinct category for heritage buildings, with flexible norms, tax incentives, and legal frameworks that encourage transformation rather than default demolition.

## 5.2 Socio-Economic Implications

The proposed reuse of the building aims to be facilitator and promoter for community development within Santa Fe locality that is known by contrasts between institutional density, aging infrastructure, and not solved public needs. So including diverse and accessible programs such as coworking spaces, educational labs, cultural workshops, a marketplace, and a rooftop urban garden makes the project support social infrastructure without displacing existing urban functions. More specifically by:

- Free and low-cost access to spaces for learning, exercising, working, and participating in cultural and environmental programs.
- Opportunities for local entrepreneurs and informal sellers to establish themselves in affordable retail modules.
- Spaces for youth and elderly two populations without the propper spaces in urban development such as craft rooms, reading lounges, and open air theathers.

This aligns with theories of urban commons, where space is neither fully public nor private, but collectively governed and co used by communities (De Angelis, 2007; Stavrides, 2016). So, by guaranteeing regular engagement, not just occasional visitation, the proposal promotes deeper social ties and a sense of ownership over urban transformation.

About the economical aspect the project aims to stimulate both aspects, the direct and indirect economic activity:

- Small businesses and services operating in the ground floor and first level contribute to microeconomies that serve local residents and people passing by.
- Educational and training spaces enhance human capital, especially for students and freelancers from nearby universities that do not have affordable working places.
- The urban plaza supports spontaneous activity markets, performances, civic gatherings that reinforce the building's role as a community node.

In Adition the Project wants to affect in a good way Social Indicators as:

- Perceptions of safety and public life through increased visibility, lighting, and informal surveillance.
- Youth engagement through productive uses of time and space (e.g., multimedia labs, workshops).
- Social cohesion, as people from different socio economic groups interact together without having exclusive settings.

Given that adaptive reuse is known for its potential to revitalize underused buildings and reactivate urban life, it also has the risk of contributing to gentrification especially in central areas of Bogotá like Santa Fe, where real estate pressures are rising and the socio-economic vulnerability of residents is high. The project taking into account this risk and integrates several strategies to mitigate gentrification.

In Bogotá, gentrification has been observed in areas like Chapinero and La Candelaria, where urban renewal projects aimed at revitalizing public space and attracting investment have sometimes resulted in Rising rents and property values, displacing long-term residents and small businesses. So, taking into account the proximity of the Esso building to major institutional centers, universities, and transit lines, it is reasonable to expect increased attractiveness and land value following its reactivation. So in this specific case the projects mitigates that by having the next strategies:

### 1. Public-Oriented Program

Unlike speculative developments that prioritize luxury housing or exclusive office space, this proposal intentionally includes:

- Low cost or free use spaces (e.g., public terraces, gardens, coworking rooms).
- Infrastructure for informal economies (e.g., temporary kiosks, small market locals).
- Cultural and educational programming open to all, not just some kind of audiences.

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### 2. Inclusive and Mixed Programming

The proposal mix uses that attract diverse users like students, elders, informal workers, families, professionals the project avoids the creation of a space that would be atractive for all kind of public, So having flexibility of space use, allowing for dynamic programming and diverse managing of spaces, and having uses that vary in cost, type and frequency make an inclusive project.

### 3. Community Integration from the Start

One of the most effective tools against gentrification is making sure that communities will get benefited but they will be also colaborating and participating in shaping the project. This can be implemented through:

- Participatory design workshops during the initial planning phases.
- Collaborative management models involving local associations or neighborhood groups.
- Transparency in operations, making sure that the building's programming responds to evolving local needs rather than external commercial pressures making it also flexible and adaptable to changing needs.

#### 4. Local Employment and Economic Inclusion

By prioritizing local sellers and workers during the activation and operation of the building through retail, maintenance, programming, or cultural events the project reinforces economic anchoring. This generates economical connection that circulates within the neighborhood rather than comming from external parts.

# 6.Conclusion.

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This thesis was thought to explore the question: What is the potential of abandoned office buildings in Bogotá to be adapted to new uses that benefit the community and promote urban sustainability? Based on the case study of the Esso Colombiana S.A. building, comparative case analyses of different contexts, and contextual research, the findings demonstrate that adaptive reuse of mid century office buildings in Bogotá have a significant potential for doing a socially inclusive, environmentally responsible, and economically feasible urban transformation.

The architectural and structural characteristics of many abandoned office buildings built in reinforced concrete during the modernist era have a big potential to host new uses because they often have open floor plans, regular grids, and durable materials making them ideal for insertion of contemporary functions without making massive modifications. In the case of the Esso building, the preservation of its existing structure and envelope makes it possible to integrate a multifunctional community program including cultural, educational, recreational, and commercial uses.

From a social perspective, the analysis of demographic and urban data revealed a clear deficit of inclusive public spaces and community infrastructure, in the zone, a growing demand for spaces that support informal economies, artistic production, digital education, and active lifestyles. By transforming the vacant Esso building into a publicly accessible facility with coworking areas, cultural workshops, recreational zones, and an urban garden, the project reclaims urban voids for social benefit. This aligns with international practices where adaptive reuse projects have become platforms for cultural inclusion, local identity reinforcement, and participatory urban renewal.

The regulatory framework and recent policy instruments like the POT 2022-2035 and the Plan Parcial CAR-Universidad Libre support central area revitalization and encourage the integration of nature based solutions and heritage sensitive reuse. Economically, even when detailed cost modeling was beyond the scope of this thesis, market analysis indicates that reuse of office buildings for community based functions can be viable if supported by public incentives, low operating costs, and flexible zoning. The inclusion of revenue generating spaces like cafés, cultural shops, and workshops contributes to operational sustainability.

So the adaptive reuse of abandoned office buildings in Bogotá is not just an spatial opportunity but a sustainable development strategy. Allowing abandoned architecture to be reintegrated into the city's daily life transforming it for public value, environmental savings, and improved urban quality without the problematics of large scale redevelopment. As the thesis wanted to show with the Esso building project, this strategy is replicable and adaptable, offering a scalable model for Bogota urban transformation.

## 6.2 Triple Bottom Line

The adaptive reuse strategy proposed in this thesis and the research question took into account the sustainability through the Triple Bottom Line (TBL) concept having environmental, social, and economic dimensions. Each of these components has been addressed through the architectural proposal, case study analysis, and contextual evaluation of Bogotá's urban challenges.

#### • Environmental Sustainability:

The project demonstrates that reusing existing office buildings significantly reduces environmental impacts and when planned with environmental strategies and nature-based solutions (NBS) such as green roofs that are also integrated as part of the functional programming, letting the community cultivate in the building contributing also to the creation of bonds between the inhabitants of the sector.

### Social Sustainability

The project responds directly to gaps in Bogotá's public infrastructure, especially in the Santa Fe locality, where residents lack cultural, recreational, and educational facilities. By dedicating floors to coworking, community workshops, artistic production, physical activity, and exhibition spaces, the reuse strategy helps creating local identity, promoting community participation, and improve perceptions of safety and vitality in the neighborhood. This is so relevant in a context like Bogota one because where vacant buildings often contribute to feelings of abandonment or urban decay it also increments insecurity. So, The reactivation of these spaces improves the social fabric and promotes urban equity.

### • Economic Sustainability

Even when the project has no full-scale economic modeling, it presents a low-cost, high-impact strategy that is based on minimal interventions and mixed-use programming. The economic sustainability of the proposal lies in its ability to generate modest income from commercial activities (e.g., café, shop, printing services), while reducing operational costs through passive design. It also explores how adaptive reuse can unlock public value by avoiding the high costs of demolition and new development. Public incentives such as tax exemptions for cultural use and integration into partial plans like the CAR-Universidad Libre redevelopment plan or even parcitipation of the universities or companies renting the spaces of the building can support long-term viability.

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## 7. References

83 References

 Alexandre, L. M. (2020). Challenges in reuse of tall office buildings in the Netherlands: A focus on the Randstad. Delft University of Technology.

- Alvarez-Díaz, C., & Villalón, R. (2023). 5 ways adaptive reuse can transform communities. AD&V. https://www.alvarez-diaz.com
- ArchDaily. (2016). Biblioteca Pública El Tintal / Daniel Bermúdez. https://www.archdaily.com/781928/biblioteca-publica-el-tintal-daniel-bermudez
- ArchDaily. (2018). SESC 24 de Maio / Paulo Mendes da Rocha
   + MMBB Arquitetos. https://www.archdaily.com/879754/sesc-24-de-maio-paulo-mendes-da-rocha-plus-mmbb-arquitetos
- Barlow, J., & Gann, D. (1995). Flexible planning and flexible buildings: Reusing redundant office space. Journal of Urban Affairs, 17(3), 263-276.
- Biblioteca Pública El Tintal. (2022). Biblioteca Pública El Tintal Manuel
   Zapata Olivella Red Distrital de Bibliotecas Públicas. https://www.biblored.gov.co/bibliotecas/biblioteca-publica-el-tintal
- Boelens de Gruyter. (n.d.). Parooltoren & Trouwgebouw, Amsterdam. https://www.boelensdegruyter.nl/en/project/parooltorentrouwgebouw/
- Bullen, P., & Love, P. (2011). Factors influencing the adaptive reuse of buildings. Journal of Engineering, Design and Technology, 9(1), 32-46.
- Caut. (2021). Edificio en Bogotá [Photograph]. Flickr. https://www.flickr.com/photos/caut/51415282724/in/photostream/
- Conejos, S., Langston, C., & Smith, J. (2013). AdaptSTAR model: A climate-friendly strategy to promote built environment sustainability. Habitat International, 37, 95-103. https://doi.org/10.1016/j.habitatint.2011.12.003
- Costa, C. N., & Lopes, J. C. (2015). Adaptive reuse as a strategy towards sustainability: Case studies of converted buildings in São Paulo. Revista Portuguesa de Estudos Regionais, (39), 51-64. https://impactum-journals.uc.pt
- Departamento Administrativo Nacional de Estadística. (2022). Déficit habitacional: Encuesta Nacional de Calidad de Vida (ECV) 2021. https://www.dane.gov.co/

- DLR Group. (2025). Addressing societal issues with adaptive reuse. https://www.dlrgroup.com
- Douglas, J. (2006). Building adaptation (2nd ed.). Butterworth-Heinemann.
- El Espectador. (n.d.). Edificio de las Palomas en Ricaurte: Lo ha visto, esta es su historia [Photograph]. https://www.elespectador.com/bogota/edificio-de-las-palomas-en-ricaurte-lo-ha-visto-esta-es-su-historia/
- Elkington, J. (1997). Cannibals with forks: The triple bottom line of 21st century business. Capstone.
- Fianchini, M., & Ferrucci, F. (2018). Adaptive reuse and sustainable urban development: Case studies from Milan. Journal of Urban Design, 23(3), 1-15.
- Fianchini, M., & Ferrucci, F. (2018). Turning empty office buildings into sustainable social housing. IAHS 42nd World Congress.
- Geldenhuys, S., & Bradfield, M. (2020). The application of triple bottom line principles to sustainable housing developments. Journal of Cleaner Production, 243, 118527. https://doi.org/10.1016/j.jclepro.2019.118527
- Geraedts, R.P., & van der Voordt, D.J.M. (2007). Atool to evaluate the transformation potential of vacant office buildings. Proceedings of CIB World Building Congress.
- González Saavedra, L. (2015, October 8). Espacio Odeón: A case of architectural heritage recovery in Bogotá. Espacio Odeón. https://www.archdaily.co/co/775544/espacio-odeon-un-caso-de-recuperacion-del-patrimonio-arquitectonico-en-bogota
- Heath, T. (2001).Adaptive reuse of office buildings for residential use: The Toronto experience. Cities, 18(3), 173 – 184.
- Kibert, C. J. (2016). Sustainable construction: Green building design and delivery (4th ed.). Wiley.
- Langston, C., & Smith, J. (2012). Modelling property management decisions: Adaptive reuse of obsolete buildings. International Journal of Strategic Property Management, 16(2), 177–192. https://doi.org/10.3846/1648715X.2011.640718

85 References

Langston, C., Wong, F. K. W., Hui, E. C. M., & Shen, L. Y. (2008). Strategic assessment of building adaptive reuse opportunities in Hong Kong. Building and Environment, 43(10), 1709-1718. https://doi.org/10.1016/j.buildenv.2007.10.017

- Merrick Architecture. (n.d.). Electra. https://merrickarch.com/work/electra/
- National Trust for Historic Preservation. (2017). Untapped potential: Strategies for revitalization and reuse. https://savingplaces.org/buildingreuse
- Perkins&Will. (2024). Carbon savings through adaptive reuse. https://perkinswill.com
- Remøy, H., & van der Voordt, D. J. M. (2014). Adaptive reuse of office buildings into housing: Opportunities and risks. Building Research & Information, 42(3), 381–390.
- Restrepo Acosta, F. (2011, November 11). Edificio de La CAR en la cl 36 con kr 7 de Bogotá [Photograph]. Wikimedia Commons.
- RenoBo. (2024). Informe de Gestión 2024. Empresa de Renovación y Desarrollo Urbano de Bogotá.
- Rodrigues, C., & Freire, F. (2017). Eco-efficiency assessment of retrofit strategies for alternative uses of an historic building. Journal of Cleaner Production, 9460.
- Secretaría Distrital de Planeación. (2022). Plan de Ordenamiento Territorial Bogotá Reverdece 2022-2035. Alcaldía Mayor de Bogotá.
- SingularGreen. (n.d.). LIFE Project of the European Union. https://www.singulargreen.com/proyecto-life-de-la-union-europea/
- Stiernon, F., Schmid, A., & Marot, B. (2023). Structural adaptation of obsolete office buildings for new uses. Sustainable Cities and Society, 72.
- Stiernon, M., et al. (2023). Office-to-housing conversions in contemporary cities: Lessons from Europe and North America. Urban Studies, 60(5), 845–869.
- Świerzawski, J., Kowalski, K., & Nowak, M. (2024). Quantifying environmental benefit of adaptive reuse: case Poland. ACSA Annual Meeting Proceedings, 112, 101-112.

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- UN-Habitat. (2015). The City Prosperity Initiative: Methodology and urban indicators. https://unhabitat.org
- van Duivenbode, O. (n.d.). The Lee Towers [Photograph].
   Archello. https://archello.com/project/the-lee-towers
- J., & Reed, R. (2008). Wilkinson, S. The business forincorporating sustainability in office buildings: The adaptive buildings. 14th reuse of existing Annual PRRES Conference.
- Wilkinson, S. J., James, K., & Reed, R. (2009). Using building adaptation to deliver sustainability in Australia. Structural Survey, 27(1), 46–61. https://doi.org/10.1108/02630800910941683

87 References