

Urban Corridors as a Tool for Sustainable Development: Case Studies from Brazil and Greece

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1 ABSTRACT

Urban corridors offer a scalable and flexible framework for sustainable urban development, integrating mobility, public space, and environmental resilience. Unlike isolated interventions, corridor planning structures urban transformation along defined spatial axes, ensuring coherence between citywide strategies and localized implementation. This paper examines the methodology through case studies in Rio de Janeiro and from three waterfront cities in Greece. In Rio, a pilot project tested the integration of multiple Sustainability Corridors through a neighborhood-scale route, linking key public spaces and enabling distributed interventions. In Greece, the corridor approach was adapted to different urban challenges: revitalizing a historic district in Heraklion, structuring a new district in Kavala, and requalifying the waterfront in Kalamata. The findings highlight the importance of designing urban and green corridors as a replicable tool for inclusive, strategic urban development.

Keywords: case study analysis, urban corridors, urban regeneration, strategic urban planning, sustainable urban development

2 INTRODUCTION

Urban corridors have become a defining strategy in contemporary urban planning and urban design, offering a structured yet flexible framework for sustainable and integrated urban development. By aligning mobility networks, public spaces, and environmental systems, corridors facilitate integrated urban transformation that extends beyond isolated interventions. Unlike traditional planning models that segment cities into distinct zones, the corridor approach embraces continuity, connectivity, and scalability, enabling both large-scale planning and localized, incremental improvements.

This paper explores the role of urban corridors as a strategic planning tool, drawing on case studies that illustrate their adaptability across different typologies of urban conditions. It examines how the methodology has been applied in Rio de Janeiro, where a citywide sustainability plan defined priority corridors, and in Greece, where three medium-sized cities adopted corridor-based strategies for revitalization, expansion, and waterfront redevelopment. By comparing these contexts, the paper demonstrates how corridors can shape urban development by structuring interventions along key spatial axes, ensuring a cohesive relationship between strategic goals and on-the-ground implementation.

By assessing the effectiveness of this approach, the paper argues that urban corridors provide a replicable and scalable model for urban development. Their ability to integrate multiple sectors – mobility, public space, ecology, and social infrastructure – positions them as a critical tool for cities striving for sustainability, resilience, and inclusivity in an era of rapid urban transformation.

3 URBAN CORRIDORS AS A PLANNING STRATEGY

Urban corridors are an essential urban planning strategy that integrates transportation with land use, supporting sustainable urban development. Unlike traditional zoning, which separates functions into distinct areas, corridor-based planning fosters more connected and dynamic urban environments that align with sustainability goals such as climate resilience, mobility, and social equity (Jurkovic, Lovokovic 2023). Defined as linear spaces where transport, economic, and social processes interact, urban corridors include roads, railways, and waterways, along with their surrounding built and natural environments. Their multifunctionality promotes accessibility, connectivity, and balanced land use (ibid.). Historically, corridor-based development has roots in models like Soria y Mata's Ciudad Lineal (1882), which structured urban growth along a central transit axis (Tufek-Memisevic, Stachura 2015), and later adaptations such as Le Corbusier's Plan Obus and Kenzo Tange's Tokyo Bay project. While these models demonstrated how transportation and urban expansion can be integrated, critics like C.A. Doxiadis emphasized the need for multi-directional growth rather than strictly linear development (ibid.).

While urban corridors have been widely explored in literature as a way to structure entire cities, Superwien's experience suggests that they are particularly effective as tools for urban regeneration and strategic planning. Rather than functioning as isolated structures, corridors act as interconnected networks that can be adapted to a wide range of urban contexts, making them a powerful mechanism for urban requalification.

A key characteristic of corridor planning is its flexibility, allowing it to function across different scales. Jurkovic and Lovokovic (2023) highlight that urban corridors strengthen public transport, promote active mobility, and contribute to economic clustering. From a sustainability perspective, they enhance environmental resilience through green infrastructure and urban forestry (*ibid.*). Superwien's application of the corridor approach builds upon these theoretical principles, but with a particular focus on how corridors structure urban growth at different levels. At a metropolitan scale, corridors align urban expansion with transport and infrastructure investments, particularly in mid-sized cities where integrated mobility solutions are crucial. At the neighborhood scale, they enable phased, incremental urban improvements, ensuring that interventions are not isolated but remain part of a broader, adaptable vision.

Unlike traditional radial urban expansion, which concentrates development around a central point, corridor planning allows for linear urban development that connects multiple centralities, fostering more dynamic and well-integrated urban structures. This aligns with contemporary concepts such as the 15-minute city and compact urbanism, which emphasize accessibility, mixed-use development, and sustainable growth. Furthermore, structuring interventions along a corridor rather than focusing on a single location allows for diversified interventions – some replicable along the route, others context-specific to key nodes. This strategy proves particularly beneficial in small and medium-sized cities, where corridors provide a structured yet adaptable approach to urban expansion.

Superwien's approach does not claim that corridor planning is superior to other methods, but recognizes its distinct advantages, particularly in ensuring long-term connectivity, coordinated urban improvements, and integration across different urban systems. By creating a framework for interventions that can evolve over time, corridor planning remains a dynamic and scalable tool for sustainable urban transformation. The following case studies illustrate its application across diverse urban contexts, demonstrating how corridors support more sustainable, connected, and adaptable urban environments.

4 CASE STUDIES OF SUPERWIEN'S URBAN CORRIDOR PROJECTS

4.1 Implementing the Corridor-Based Urban Strategy in Greece: Urban Transformation Across Three Contexts

As part of an initiative led by the World Bank, in collaboration with the European Commission's DG REGIO, a pilot project was developed to test practical methods for strengthening the capacity of Greek cities in implementing Sustainable Urban Development (SUD) strategies. Recognizing the challenges faced by small and medium-sized cities, including urban sprawl, aging populations, inadequate public space, and a lack of integrated mobility solutions, the project introduced an approach based on corridors of development. These corridors serve as spatial frameworks for guiding urban growth and regeneration in a more structured and strategic manner.

The project was piloted in three cities – Kalamata, Kavala, and Heraklion – each representing a different urban condition in which the corridor-based methodology was applied. In Kalamata, the focus was on the requalification of the waterfront, aligning with strategies for active mobility, cultural activation, and green infrastructure. In Kavala, the intervention was aimed at the development of a new district, ensuring a sustainable urban expansion with integrated transport and public space solutions. Meanwhile, in Heraklion, the methodology was tested through design-based research in a historically dense neighborhood, targeting urban revitalization through social and environmental improvements.

In all three cases, the corridor approach allowed long-term strategic planning, identifying key development axes while integrating short-term interventions that could catalyze transformation. By combining different sectors – mobility, public space, green infrastructure, cultural heritage, and economic activation – the corridors established a framework for multi-scalar urban development.

4.1.1 Kalamata: Transforming the Waterfront into a Sustainable Public Space

Kalamata, a historic Mediterranean port city, has long relied on its waterfront as a central economic and social hub. However, the area faced fragmented urban spaces, a lack of accessibility, and car-dominated streetscapes, which limited its potential as a vibrant public space. The corridor strategy in Kalamata focused on redefining the waterfront as a connected and accessible urban environment that prioritizes pedestrians, cyclists, and cultural activities.

A series of actions were identified to enhance connectivity, improve public spaces, and introduce green infrastructure and climate resilience measures. The requalification of Navarinou Street was one of the central proposals, with the goal of transforming it into a shared space that adapts to seasonal variations, allowing for pedestrian-friendly zones in the summer while maintaining limited traffic during the rest of the year. This was complemented by the proposal of a continuous pedestrian and bicycle connection along the waterfront, ensuring accessibility and fostering sustainable mobility. Proposals for public space improvements included the revitalization of Limenikou Park, the redesign of the Kilometer Pier, and the reclamation of the port warehouse as a cultural and economic hub. Climate adaptation played a key role in the strategy, with interventions addressing coastal erosion, flood management, and biodiversity restoration. The corridor also allowed for the integration of waste management solutions and sustainable tourism initiatives, ensuring that the waterfront transformation would be both environmentally and economically sustainable.

By structuring the redevelopment of the waterfront along a clear spatial axis, the corridor approach enabled Kalamata to develop a cohesive vision for its future. The transformation was not limited to a single intervention but rather consisted of a network of connected public spaces that together created a more livable, inclusive, and resilient urban environment.



Fig. 1 and Fig. 2: Comprehensive Planning for Kalamata's Waterfront and Port Area. The left image presents a large-scale map of Kalamata's waterfront, highlighting all proposed projects from the long list. The right image provides a detailed axonometric view of the port area, illustrating specific interventions for its redevelopment. Source: Superwien, 2024.

4.1.2 Kavala: Developing a Sustainable New District in Perigiali

In Kavala, the corridor methodology was applied in a different urban context: a new district development. The city is undergoing an urban expansion in Perigiali, an area with a mix of vacant land, industrial uses, and scattered residential developments. Without a clear design framework, there was a risk of uncontrolled growth and fragmented infrastructure. The corridor-based approach provided a structured development strategy, ensuring that new urbanization would be sustainable, well-connected, and integrated into the city's broader mobility and public space networks.

The corridor plan for Perigiali focused on establishing a strong spine for mobility and public space development. A Main Active Corridor was introduced to link the new district to the existing city, ensuring integration with Kavala's public transport system. This corridor was designed to prioritize pedestrian and cycling infrastructure, incorporating green spaces, urban furniture, and shaded pathways to create a human-scaled environment.

Public space played a central role in shaping the identity of Perigiali. A new central public square, adjacent to a planned cultural center, was designed as the social and economic heart of the district. This space was planned to host cultural events, markets, and recreational activities, fostering community engagement and

economic activation. Additionally, the strategy included the transformation of underutilized areas, such as the stadium parking lot, into public plazas and sports facilities.



Fig. 3 and Fig. 4: Strategic Development for Kavala's Perigiali District. The left image presents an overview of the long list of proposed projects for the Perigiali district, outlining key interventions for sustainable urban growth. The right image illustrates an axonometric view of the proposed corridor, showcasing Superwien's approach to structured urban expansion and connectivity. Source: Superwien, 2024.

A key innovation of the Perigiali corridor was its integration of green and blue infrastructure. The revitalization of the stream running through the area introduced a linear park, combining flood protection, biodiversity restoration, and public space creation. Similarly, new community gardens and pocket parks were proposed throughout the district, enhancing the environmental quality of the urban fabric.

By applying the corridor methodology to a new district, the project demonstrated how structured urban expansion can be sustainable and inclusive. Instead of isolated developments, the framework ensured that Perigiali evolved as a cohesive urban environment, balancing residential, cultural, and economic functions within a walkable and interconnected public space network.

4.1.3 Heraklion: Revitalizing a Historic Neighborhood Through a Corridor-Based Approach

Unlike Kalamata and Kavala, where the corridor strategy was applied to large-scale interventions, Heraklion's Agia Triada district required a small-scale urban revitalization approach. This historic neighborhood, characterized by dense urban fabric and narrow streets, was facing declining building conditions, underutilized public spaces, and mobility challenges. The corridor methodology provided a framework to reorganize the urban structure, enhance social cohesion, and preserve the neighborhood's architectural identity.

The key intervention in Agia Triada was the creation of a pedestrian-oriented active mobility corridor, linking cultural landmarks, historic squares, and community spaces. The rehabilitation of dilapidated buildings played a crucial role in preserving the area's unique character, while at the same time introducing new cultural, social, and economic functions into underutilized structures.



Fig. 5 and Fig. 6: Urban Regeneration Strategy for Heraklion's Agia Triada. The left image provides an overview of the long list of proposed projects aimed at revitalizing the Agia Triada neighborhood. The right image presents an axonometric view of the proposed corridor, highlighting key interventions for enhancing mobility, public space, and heritage preservation. Source: Superwien, 2024.

Mobility improvements focused on reducing car dependency and enhancing pedestrian connectivity. A key strategy was the transformation of key streets into shared spaces, limiting vehicle access and prioritizing walking and cycling. The plan also introduced a cultural heritage route, guiding residents and visitors through significant historic sites, public art installations, and renovated community spaces.

Environmental sustainability was embedded in the corridor approach, with pocket parks, urban greening projects, and climate-adaptive infrastructure integrated into the revitalization process. Public space upgrades included new urban furniture, street lighting, and recreational areas, ensuring that the neighborhood remained inclusive and accessible for all.

Through this context-sensitive application of the corridor methodology, Agia Triada's revitalization strategy successfully balanced heritage preservation with contemporary urban needs. Instead of large-scale demolition or redevelopment, the project focused on incremental improvements, adaptive reuse, and participatory urbanism.

4.2 Pilot Implementation of Rio de Janeiro's Plan

Rio de Janeiro faces significant challenges in integrating sustainability into its urban planning strategies. To address these challenges, the Sustainable Development and Climate Action Plan (PDS) was developed by the Planning Office of Rio de Janeiro (EPL) as a long-term strategy to guide the city's sustainable development. One of the most interesting aspects of the plan is its use of corridors to define priority areas for urban transformation. These Sustainability Corridors structure the city's development strategy, categorizing different regions by thematic priorities, which are represented by colors. Green corridors emphasize urban forestry and climate adaptation, blue corridors focus on water management and river restoration, while brown corridors address mobility, infrastructure, and transport-oriented development. This approach provides a structured yet flexible way to integrate sustainability goals across different areas of the city, ensuring that interventions align with broader urban development objectives.

While the PDS sets a citywide vision, the challenge was to bring these large-scale strategies into implementation at a citizen scale. To bridge this gap, C40 and the Inter-American Development Bank (IDB) collaborated with the city to implement the project, with Superwien as the consulting office responsible for leading the design and pilot implementation, and, developing a methodology for future applications of urban corridors in Rio de Janeiro. The strategy focused on defining a route within a neighborhood that intersected multiple corridors from the PDS, serving as a structured development path where interventions could take place along a defined trajectory rather than being limited to a single location. The Oswaldo Cruz neighborhood was selected as the site for the pilot project, with a route that connected key public spaces, ensuring a multi-sectoral and integrated approach to sustainability.

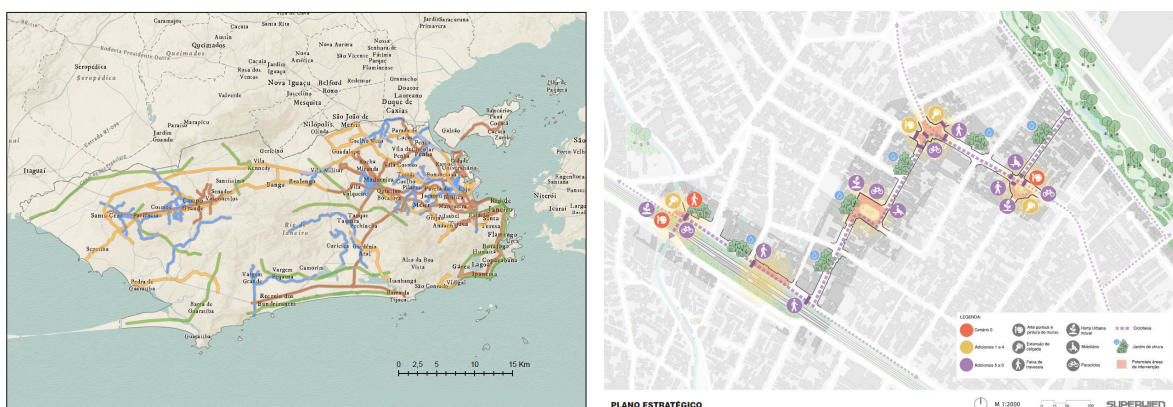


Fig. 7: and Fig.8: Sustainability Corridors and Pilot Implementation Strategy in Rio de Janeiro. The left image displays the spatialized Sustainability Corridors from Rio de Janeiro's Sustainable Development and Climate Action Plan (PDS). Source: EPL, n.d..The right image illustrates the strategic plan for implementing sustainability interventions along the designated route in Oswaldo Cruz during the pilot project. Source: Superwien, 2024.

By establishing this route, the project ensured that the implementation was not concentrated in a single intervention point but rather unfolded as a sequence of interventions along the route. Some elements were replicated throughout the entire path, reinforcing a coherent identity and structure, while others were designed specifically for key locations identified during the participatory planning process. This flexibility

allowed a variety of urban improvements to be implemented simultaneously, including street transformations, landscape enhancements, community engagement activities, and mobility improvements. The fact that the project was structured along a route also created opportunities for other municipal offices and public institutions to contribute. Different departments and agencies of the city administration could align their own agendas with the project's framework, identifying areas within the route where they could implement complementary interventions, further expanding the impact of the initiative.

The methodology for defining the route was based on participatory and dialogue-oriented planning, ensuring that the most relevant intervention points responded directly to the needs of the neighborhood. Through workshops and spatial analysis, key locations such as Paulo da Portela Square and the Rio das Pedras riverbank emerged as focal points for public space activation. The route also incorporated elements of multiple Sustainability Corridors: it enhanced green infrastructure and urban forestry, addressed mobility challenges and transport accessibility, and integrated river restoration and flood mitigation efforts. This combination of priorities allowed for a comprehensive approach that linked environmental, social, and mobility improvements within a single framework.

To translate the broad sustainability goals into concrete actions, the implementation relied on placemaking and tactical urbanism interventions that could demonstrate immediate, visible change while fitting into the larger development strategy. These included community gardens to promote urban agriculture and environmental education, temporary street closures and painted crosswalks to improve pedestrian accessibility, artistic murals with sustainability themes to strengthen local identity, and vertical gardens made from recycled materials to expand green infrastructure. These interventions acted as low-cost, high-impact solutions, showcasing how large-scale sustainability frameworks could be brought to life through community-driven, localized improvements.

The experience in Rio de Janeiro highlights how corridors can serve as adaptable, multi-scalar planning tools in low-income neighbourhoods, not only structuring urban development at a metropolitan scale but also enabling localized, incremental improvements at the neighborhood level. Rather than treating corridors as rigid urban infrastructures, this project demonstrated that they can function as flexible networks that evolve with community needs, fostering a dynamic relationship between strategic planning and on-the-ground action. The corridor approach, when combined with routes as development paths, ensures that sustainability efforts are not just planned at a citywide level but also felt and experienced in the daily lives of residents.



Fig. 9: and Fig.10: The project in the Oswaldo Cruz neighbourhood in Rio de Janeiro exemplified the participatory design of integrated urban corridors, but also showcased a concrete interaction with the society through placemaking workshops and implementation. Source: Superwien, 2024.

This project also provided key insights into how sustainability-focused urban regeneration can be effectively implemented. First, large-scale (strategic) planning must be adaptable to local conditions to ensure that sustainability strategies translate into meaningful change. Second, a route-based approach allows for distributed local, place-based interventions, ensuring a broader impact and enabling different stakeholders to contribute over time. Third, corridor planning should not be limited to broad city-scale interventions but must integrate localized, community-driven improvements. Lastly, collaborative engagement with different municipal departments and stakeholders expands the potential for long-term success, as the structured route allows multiple actors to align their efforts within a shared framework.

By demonstrating how city-scale sustainability frameworks can be implemented incrementally through localized action, the Rio de Janeiro case study provides a replicable model for cities seeking to balance strategic urban planning with tangible, citizen-scale improvements. The integration of participatory planning, flexible urban strategies, and targeted interventions establishes a new way of thinking about corridor-based development – one that is not only strategic but also rooted in community needs and lived experiences.

5 CONCLUSION

Urban corridors offer a versatile and structured approach to urban development, bridging large-scale strategic planning with localized, citizen-focused implementation. The case studies explored in this paper – from Rio de Janeiro’s sustainability corridors to the tailored applications in Greek waterfront projects – demonstrate how this methodology provides a flexible yet cohesive framework for urban transformation. By structuring interventions along defined spatial axes, corridors ensure that urban development aligns with mobility networks, public space improvements, and environmental sustainability.

The key advantage of the corridor approach lies in its scalability and adaptability. Whether applied to a dense historic neighborhood, a waterfront redevelopment, or the expansion of a new district, corridors create systematic yet context-sensitive pathways for development. Furthermore, their multi-sectoral integration enables cities to align various policy agendas within a single, interconnected strategy.

As cities continue to face pressing challenges such as climate change, social inequality, and urban sprawl, corridor planning emerges as an effective tool for achieving sustainable and inclusive urban growth through place-based urban design solutions. By fostering connectivity, prioritizing active mobility, and supporting community-driven improvements, urban corridors serve as a replicable model for cities worldwide, ensuring urban development that is deeply rooted in the everyday experiences of its residents.

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