

Multimodal Urban Hub for Jamundí

**From Metropolitan Diagnosis to
Architectural Competition**



**Politecnico
di Torino**

Politecnico di Torino

Corso di Laurea Magistrale in Architettura Costruzione Citta'
A.a 2025/2026

A Multimodal Urban Hub for Jamundí

From Metropolitan Diagnosis to Architectural Competition

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Connaître, c'est toujours transformer

Conocer es transformar

To know is to transform

Gaston Bachelard

En la culminación de esta etapa, quiero agradecer en primer lugar a Dios, quien me ha concedido y acompañado en todos los sueños que le he pedido, incluso en aquellos que parecían imposibles o inalcanzables. Gracias a mi mamá y a mi papá, que a lo largo de toda mi vida se han esforzado inmensamente por brindarnos a mi hermano y a mí las mejores oportunidades. Gracias a mi hermano, a mis tías, tíos, primos e incluso a mis abuelos que hoy están en el cielo, quienes desde niña me han apoyado en cada etapa de mi vida y se han alegrado conmigo en cada logro alcanzado.

Of course, I would also like to thank our supervisors, Professors Lorenzo Savio, Harold Medina, and Frank Ramirez, who from the very first day they agreed to guide this work, showed constant willingness to provide ideas, suggestions, and corrections. Thank you for generously sharing your knowledge with us.

I would also like to thank my thesis partner, Natalia, especially for suggesting that we undertake this project together, as it turned out to be an invaluable and rewarding journey. Thank you for your patience, your ideas, and your dedication throughout this process. I take with me many beautiful memories and meaningful moments from the work we shared.

Additionally, I would like to take this opportunity

to thank all the friends who accompanied me at different moments throughout this stage, including those who are no longer as close today. A special thank you goes to my closest friends, who are like a second family to me. To my best friends in Cali—Valentina, Laura, Sebastian, Santiago, Valeria, and JuanG—who have loved me since my earliest years and have supported my growth despite the distance. And to my best friends in Turin—Catalina, Isabella, Esteban, and Natalia—who have been my home and refuge from the very first moment.

Infine, desidero ringraziare il mio capo, l'Architetto Alberto Sasso, non solo per avermi dato l'opportunità di lavorare con lui e di imparare costantemente, ma anche per la grande disponibilità, comprensione e supporto dimostrati durante tutto questo percorso. Un sentito grazie anche alle mie colleghe Debora e Francesca per l'amicizia e l'aiuto prestati sul lavoro ogni volta che ne ho avuto bisogno. Porterò sempre con me il ricordo del mio primo lavoro come un'esperienza preziosa e positiva.

Nothing presented in this work would have been possible without the people who accompanied and supported me throughout this process; to all of them, my sincere gratitude.

Andrea

I would like to begin by thanking my parents. From day one, you have encouraged and supported me to go beyond what I believed myself capable of. Thank you for always believing in me, for your patience, and for being present at every moment of this journey. To Pipev and Juli, thank you for being there with your companionship and constant support. And to my entire family, who, even when far away, always found a way to make me feel loved and supported.

To Juan Felipe, thank you for being my safe place and, at the same time, my driving force. For holding me up when I could not go on, for giving me peace when I felt overwhelmed, for listening to me again and again when I could not find the right words, and for always reminding me that I was capable.

To Andrea, thank you for sharing this process from beginning to end. For the effort, discipline, and consistency with which we carried all of this forward; for the conversations and late nights when we thought we would never finish; but above all, for your unconditional friendship.

I would also like to express my gratitude to our advisors, Lorenzo Savio, Harold Medina, and Frank Ramírez, for their guidance and support throughout this work. Thank you for guiding us and helping us develop the project in the best possible way, providing clarity and

sound judgment throughout the entire process.

Finally, I thank from the heart my closest friends in Colombia (Majo, Tefa, Dani, Juli, Caro) and those who became my small family away from home (Andre, Cata, Dani, Juli, Esteb, Mafe, Edona, Isa). Thank you for helping me move through this process without losing myself in it, for listening, for encouragement, for the plans that gave me room to breathe, for timely messages, and for reminding me that life continued beyond the thesis.

Today, I close this stage with pride and gratitude. This achievement would not be the same without the support and contribution of each and every one of you. For that reason, I celebrate it not only as a personal accomplishment, but as a shared achievement made possible by the people who accompanied me throughout this journey.

Natalia

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Abstract
Introduction
Methodology

Abstract

This thesis is structured in two complementary phases that connect metropolitan diagnosis with an architectural design mechanism, applied to the case of the Área Metropolitana del Suroccidente de Colombia (AMSO), with a particular focus on the Cali-Jamundí relationship. In recent decades, accelerated urban growth, demographic pressure, and territorial fragmentation have intensified spatial inequalities and mobility pressures within the region, resulting in intermunicipal dependency and positioning Jamundí as a commuter or “dormitory” city within the metropolitan system. The consolidation of the AMSO and the formulation of the Tren de Cercanías del Valle (commuter rail) project represent a strategic opportunity to address these challenges through integrated and sustainable territorial planning.

The first phase of the research develops a territorial and urban diagnosis that examines land-use patterns, mobility infrastructure, demographic trends, and service distribution. This analysis reveals a structural imbalance in which employment, higher education, cultural facilities, and specialized services remain highly concentrated in Cali, generating intense daily commuter flows and reinforcing Jamundí’s functional dependence, while limiting its capacity to consolidate as an autonomous urban center within the metropolitan system.

Building on this diagnosis, the thesis adopts the

theoretical frameworks of polycentric urban development, the 15-minute city, and Transit-Oriented Development (TOD) to identify opportunities for metropolitan rebalancing. A radial analysis methodology is developed and applied to existing and projected transport stations, evaluating accessibility, functional diversity, and service provision within walkable catchment areas, and enabling the identification of spatial patterns, functional deficiencies, and opportunities for urban transformation. In this context, the Tren de Cercanías project is examined as a structuring device capable of reorganizing mobility patterns and supporting the emergence of new urban centralities. In Jamundí, the southern terminal station (Station 21) is identified as a critical node due to its proximity to the historic railway station, the urban center, and the environmental protection edge.

The second phase of the thesis shifts from analysis to proposition, framing architecture as an operational tool for territorial transformation. Rather than proposing a single design solution, the project constructs an architectural competition as a methodological and disciplinary mechanism through which research findings are translated into spatial form. The competition brief defines the commission of a multimodal urban facility that complements both existing and future railway infrastructure, integrating public transport, education, cultural programs, and spaces for work and productivity, conceived

as a catalyst for reducing commuter dependency while reinforcing Jamundí’s role within the AMSO network.

Accordingly, the competition is structured through a set of explicit urban, environmental, and architectural criteria design requirements, that guide design proposals beyond purely formal considerations. These include effective multimodal integration, ground-floor permeability, active public space, articulation with railway heritage, bioclimatic strategies adapted to the tropical climate, and the incorporation of the environmental protection edge as a civic landscape. The architectural program is organized into three main systems—education and higher learning, culture and citizenship, and work and productivity—supported by shared services that promote flexibility and hybrid use, positioning the architectural competition as the concluding synthesis of the research.

Introduction

In recent decades, processes of metropolization in Latin America have produced profound territorial transformations, characterized by accelerated urban growth, a strong concentration of services and opportunities in core cities, and an increasing functional dependence of peripheral municipalities. In this context, everyday mobility has become one of the main challenges for urban and territorial planning, as it exposes structural imbalances in the distribution of infrastructure, facilities, and productive activities. The Área Metropolitana del Suroccidente de Colombia (AMSO) represents a paradigmatic case of these dynamics, in which the city of Cali operates as the dominant metropolitan pole, while municipalities such as Jamundí have progressively assumed the role of commuter or dormitory cities.

Within this context, the thesis is guided by the following research question:

- How can architecture contribute to addressing the functional dependence of Jamundí on Cali within the emerging metropolitan structure of the Área Metropolitana del Suroccidente de Colombia, in the context of the Tren de Cercanías?
- Based on this question, the general objective of the research is to develop and

test a design-based research framework in which architecture functions as a territorial instrument capable of supporting the reconfiguration of mobility patterns and urban centralities in Jamundí in relation to the Tren de Cercanías project.

This objective is pursued through the following specific objectives:

- To analyze the process of metropolitan formation in the AMSO, with particular emphasis on the functional relationship between Cali and Jamundí.
- To examine the Tren de Cercanías project as a metropolitan mobility infrastructure and assess its potential territorial implications.
- To develop a theoretical and methodological framework integrating polycentric development, Transit-Oriented Development, and design-based research.
- To construct an architectural competition brief as an operative instrument translating territorial analysis into spatial and programmatic guidelines.
- To test and critically assess this framework through an exploratory architectural proposal and qualitative validation with external architects.

Chapter 1 develops the territorial and contextual framework of the research. Through an analysis of the process of formation of the AMSO, it examines the main challenges faced by its municipalities, with particular attention to the functional relationship between Cali and Jamundí. The rapid demographic growth of Jamundí, driven primarily by the expansion of residential housing supply, has not been accompanied by an equivalent consolidation of employment opportunities, urban services, or metropolitan-scale facilities. As a result, daily commuter flows toward Cali have intensified, generating pressure on existing road infrastructure, increasing travel times, and reinforcing a structural dependence that limits Jamundí's urban autonomy. Within this context, the recent institutional consolidation of the AMSO and the formulation of the Tren de Cercanías del Valle del Cauca project emerge as a strategic opportunity to rethink mobility patterns and territorial development from an integrated and sustainable perspective.

Building on this diagnosis, **Chapter 2** introduces the theoretical and methodological framework that supports the research. Drawing on the principles of polycentric urban development, the 15-minute city, and Transit-Oriented Development (TOD), the study analyzes the relationship between transport infrastructure, land-use distribution, and accessibility to services across different spatial scales. This chapter also presents the radial analysis methodology, applied to the three transport stations planned for Jamundí within the Tren de Cercanías project and subsequently compared with two existing stations in the city of Cali. The methodology enables an evaluation of service availability, functional diversity, and the potential of transport nodes to operate as new urban centralities within the metropolitan system.

On the basis of these foundations, **Chapter 3** outlines the transition from analytical research to project-based proposition. Rather than

developing a single architectural design, the thesis constructs an architectural competition as an operative instrument of metropolitan intervention. This chapter describes the process of translating territorial diagnosis into design criteria, addressing the technical context of the Tren de Cercanías, regulatory, heritage, and environmental constraints, and the definition of the urban and architectural guidelines that structure the competition. The objective is to transform analytical evidence into an architectural commission capable of responding to complex metropolitan challenges. In particular, the area surrounding the future central station of the Tren de Cercanías is identified as the focus of the proposal, due to its strategic location, its connection to historic railway infrastructure, and its proximity to environmentally protected areas.

Finally, **Chapter 4** presents the intervention proposal for a multimodal urban node in the municipality of Jamundí, associated with the southern terminal station of the Tren de Cercanías. This node is conceived as a hub integrating public transport, education, cultural facilities, and spaces for work and productivity, articulating railway infrastructure, public space, and mixed-use urban programs. The proposal aims to reduce commuter dependence, support the emergence of new urban centralities, and strengthen Jamundí's role within the polycentric structure of the AMSO.

Overall, the thesis establishes an integrated framework that links metropolitan diagnosis, theoretical and methodological tools, and architectural design. Architecture is addressed as an operational component within a broader territorial strategy, contributing to the reorganization of mobility, land use, and urban functions in order to support a more balanced and efficient metropolitan structure.

Methodology

This thesis follows a mixed-methods methodology with qualitative predominance, combining territorial analysis, theoretical research, and design-based research. Quantitative spatial data are used to support territorial diagnosis, while qualitative analysis informs interpretation and strategic decision-making. Within this framework, architectural design is not conceived as a final outcome, but as an operative research instrument through which analytical findings are translated, tested, and critically assessed.

The research is organized into five consecutive phases: territorial analysis, theoretical and methodological construction, project-based framework definition, exploratory architectural design, and qualitative validation and discussion. Each phase corresponds to a specific stage of the research process and contributes to the development and assessment of a design-based research proposition.

Phase 1 - Contextual and Data-Based Analysis

The first phase consists of the analysis of the metropolitan and urban context of the Área Metropolitana del Suroccidente de Colombia (AMSO), with a focus on the relationship between Cali and Jamundí, and discussed in Chapter 1. The analysis is based on the collection of quantitative and qualitative data from official and institutional sources, including national statistics (DANE), municipal planning documents, geographic

databases, academic reports produced by universities, and news articles.

The information is processed through cartographic analysis, using thematic maps to identify land-use distribution, demographic growth, mobility infrastructure, environmental constraints, and service location. This analysis allows the identification of commuting patterns, spatial imbalances, and areas of strategic relevance linked to existing and planned transport infrastructure. The results of this phase define the case study and the main issues addressed in the research.

Phase 2 - Theoretical Review and Analytical Framework

The second phase focuses on the review of academic literature related to urban development and mobility, presented in Chapter 2. The theoretical framework is built through the analysis of scholarly articles, books, and institutional publications on polycentric urban development, the 15-minute city, and Transit-Oriented Development (TOD).

Based on these references, a radial analysis methodology is defined as an analytical tool to evaluate the spatial organization of services and land uses around transport stations. The methodology is applied to three planned stations in Jamundí within the Tren de Cercanías

project and to two existing transport stations in Cali. Each case is analyzed within a walkable radius, allowing for a comparative evaluation of accessibility, functional diversity, and service availability. The results are used to assess the potential role of each station as an urban node.

Phase 3 - Definition of the Architectural Competition

The third phase translates the analytical outcomes into a project-based framework through the definition of an architectural competition, as outlined in Chapter 3. The competition is conceived as an operative research instrument, structuring the architectural response while allowing for multiple interpretations rather than prescribing a single design solution.

This phase includes the review of urban regulations, land-use norms, heritage conditions, and environmental constraints affecting the selected site. On this basis, a set of design criteria is defined, including programmatic requirements, spatial relationships, and performance objectives. These criteria are derived from the previous analytical phases and guide the formulation of the competition brief.

Phase 4 - Architectural Design Proposal

The fourth phase consists of the development of an exploratory architectural design associated with the southern terminal station of the Tren de Cercanías in Jamundí, presented in Chapter 4. Rather than constituting a definitive project, this proposal functions as a testing device within the design-based research process, allowing for the evaluation of the feasibility and coherence of the criteria defined in the competition brief.

The proposal integrates transport infrastructure, public space, and mixed-use programs. Design decisions are assessed in relation to accessibility, spatial organization, and functional integration, using the project to test the spatial implications of the research findings.

Phase 5 - Qualitative Validation and Critical Discussion

The final phase involves the qualitative evaluation of the proposed competition framework through feedback from external architects. The competition brief was shared with a selected group of professionals, who responded to open-ended questions regarding the clarity, relevance, and feasibility of the proposed commission. The responses were analyzed qualitatively and informed both the refinement of the brief and the critical discussion presented in the Results and Discussion chapters. This phase allows the research to assess the robustness and operability of the design-based proposition beyond the authors' own interpretation.

Methodological Limitations and Ethical Considerations

The research is based on secondary data and projected infrastructure scenarios. As the Tren de Cercanías has not yet been implemented, assumptions regarding mobility patterns and urban development are subject to change. The study does not include empirical validation through implementation or post-occupancy analysis.

All data used are obtained from publicly available sources. No personal data are collected, and the research complies with ethical standards regarding data use and territorial analysis.

01

The “Área Metropolitana del Suroccidente de Colombia” (AMSO)

State of Art: Overview of the Área Metropolitana del Suroccidente de Colombia (AMSO)

Challenges faced by the AMSO municipalities

The case of Jamundi and Cali: statistics, indicator, key issues

The *Tren de cercanías*: The project and historical events

State of Art

Overview of the *Área Metropolitana del Suroccidente de Colombia (AMSO)*

Metropolization has become a consolidated urban phenomenon of great interest in the global context. It arises from the interaction among different municipalities surrounding a city, which, due to its socioeconomic and cultural characteristics, functions as a major pole of attraction for citizens (Alfonso R., 2024). The attracting city thus becomes a nucleus for nearby settlements, generating strong interdependent relationships and, in many cases, turning secondary settlements into dormitory or satellite cities.

This global phenomenon also takes place in Colombia. Despite being a country with a significant amount of rural territory, the exponential population growth of recent decades has led to the unbalanced expansion

of the nation's main urban centers (Pérez 2014). This phenomenon has been referred to by the DPN¹ as urban agglomeration, and it is currently one of the most widely debated topics on the agenda of territorial government entities (Pérez, 2014).

Although the problem and some of its causes had been identified for several decades, Colombia historically lacked a strong national-level institutional authority or regulatory instrument to effectively coordinate metropolitan governance (Pérez 2014). As a result, the consolidation of metropolitan areas depended largely on ad hoc agreements among municipalities and local governments, often leading to fragmented decision-making, delays, and limited capacity for integrated territorial planning.

In response to the fast urban agglomeration at a national level and its subsequent challenges, the national government established a legal instrument that allows different municipalities and core cities to join forces and work together: the metropolitan areas. This territorial framework aims to establish strategies and contribute to adequate spatial planning, no longer of each municipality separately, but collectively. In this way, territorial entities within the same metropolitan area are expected to align their land-use plans, transportation systems, housing programs, public services, infrastructure, security, and environmental protection.

At present, the term metropolitan area in Colombia is legally defined and regulated

¹ DPN (Departamento Nacional de Planeación): Colombia's National Planning Department, the government agency responsible for formulating, coordinating, and evaluating public policies and national development plans.

Figure 1 - Legal regulations in Colombia for metropolitan areas. | Source: Author's own elaboration with data from the Colombian Constitution (1991).



Figure 2 - Metropolitan areas in Colombia. | Source: Author's elaboration based on La metropolización planetaria y sus escalas en Colombia, Universidad Externado de Colombia (2022)

Legal regulations for metropolitan Areas in Colombia

Law 61 of 1978	Organic Law of Urban Development
Decree 3104 of 1979, repealed by Law 128 of 1994	Established the initial framework and operational regulations for Metropolitan Areas in Colombia
Law 99 of 1993	Grants metropolitan areas the authority to issue environmental licenses, permits, concessions, and authorizations within their urban boundaries.
Law 128 of 1994, repealed by Law 1625 of 2013	Organic Law of Metropolitan Areas
Law 388 of 1997	Law of Territorial Development. Introducing the Land Use Plans (Plan de Ordenamiento Territorial (POT)) as instruments for urban and regional planning.
Law 1625 of 2013	Issues the New Legal Regime for Metropolitan Areas, updating the principles of governance, coordination, and sustainable development.

Regional Scale

Valle del Cauca

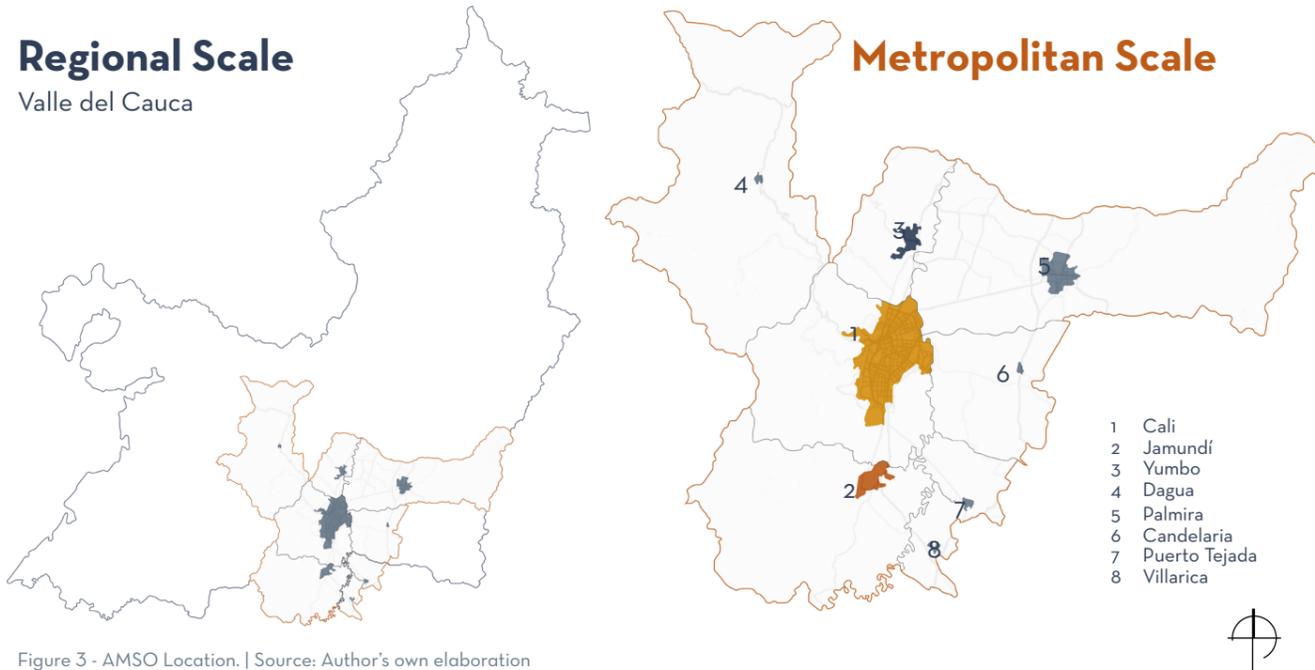


Figure 3 - AMSO Location. | Source: Author's own elaboration

under Law 1625 of 2013, which establishes the institutional framework for their creation and governance. Under this legal regime, Colombia has seven metropolitan areas: Área Metropolitana del Suroccidente de Colombia, Área Metropolitana Centro de Occidente, Área Metropolitana del Valle de Aburrá, Área Metropolitana de Barranquilla, Área Metropolitana de Valledupar, Área Metropolitana de Cúcuta and Área Metropolitana de Bucaramanga. These are recognized as the principal areas with the highest demographic and economic development within the country's national urban system.

Within the framework of this thesis, the case study is the Área Metropolitana del Suroccidente de Colombia (AMSO)², located in the Valle del Cauca region with a partial extension into the neighboring department of Cauca. With an approximate extension of 3,825 km², it was initially projected to be composed of seven municipalities: Cali, Jamundí,

² AMSO (Área Metropolitana del Suroccidente Colombiano): acronym referring to the consolidated metropolitan area in southwestern Colombia. The English translation is Colombian Southwestern Metropolitan Area.

Candelaria, Palmira, and Dagua, together with Villa Rica and Puerto Tejada, which belong to the Cauca region, with an estimated total population of 2,935,972 inhabitants, with 97.53% living in urban areas and 2.47% in rural areas (Galeano Loaiza 2019). However, on November 24, 2024, through a popular referendum, only Jamundí, Cali, and Puerto Tejada approved their integration, leaving open the possibility for the other municipalities to join in the future.

Cali is considered the third-largest urban agglomeration in Colombia (Alfonso R. 2024). As a metropolitan area, it constitutes one of the country's main economic engines due to the high concentration of industries, commerce, services, and logistics, further reinforced by its proximity to one of the most important ports in the national territory, the port of Buenaventura. It also plays a crucial cultural role in the Pacific region, serving as a multicultural hub as a result of the significant influx of migrants from southwestern Colombia. Together with Cali, the municipalities that comprise its metropolitan area have gained prominence in regional development, fostering metropolitan interactions that strengthen territorial integration and functionality (Alcaldías del AMSO 2024).

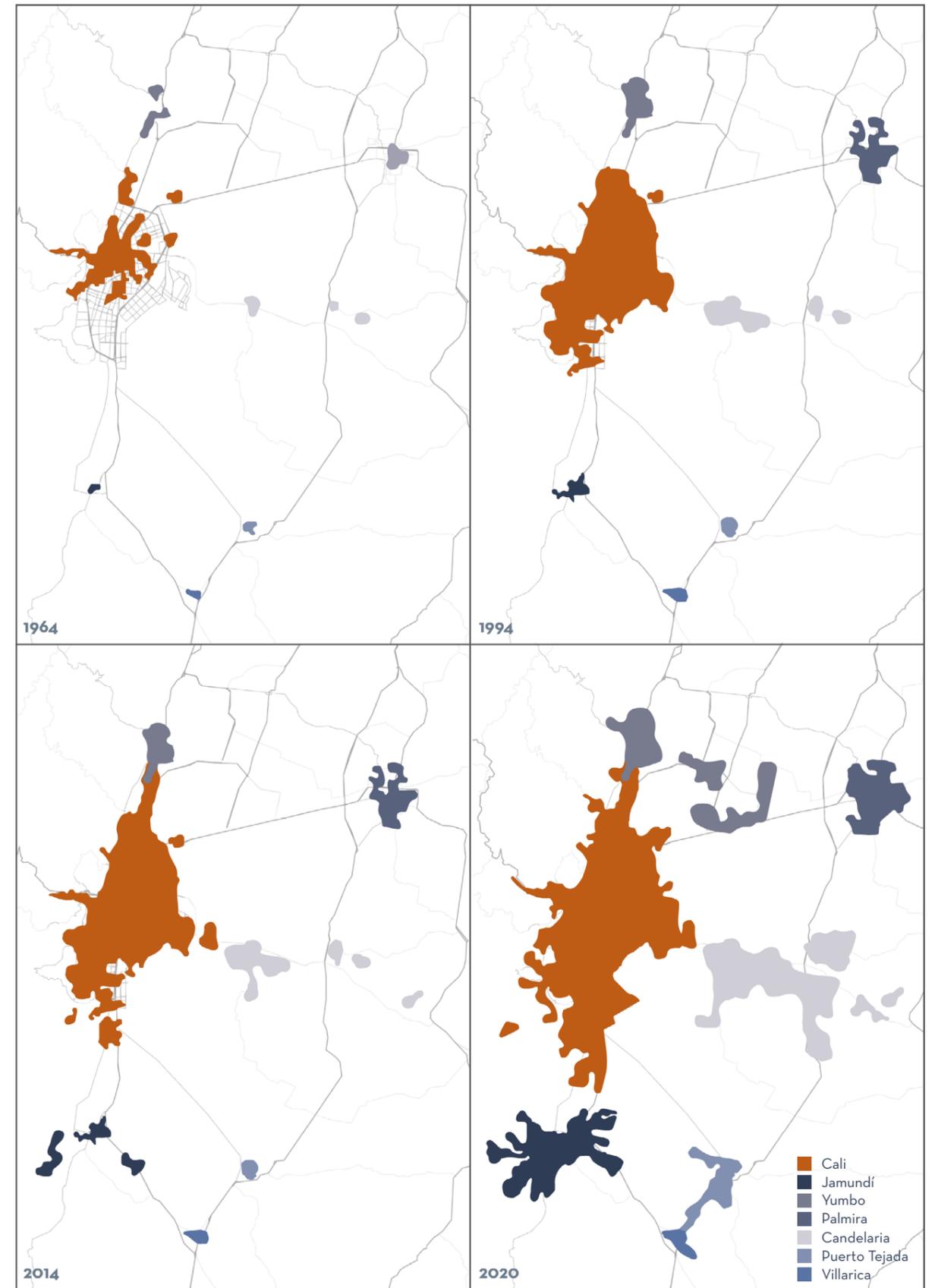
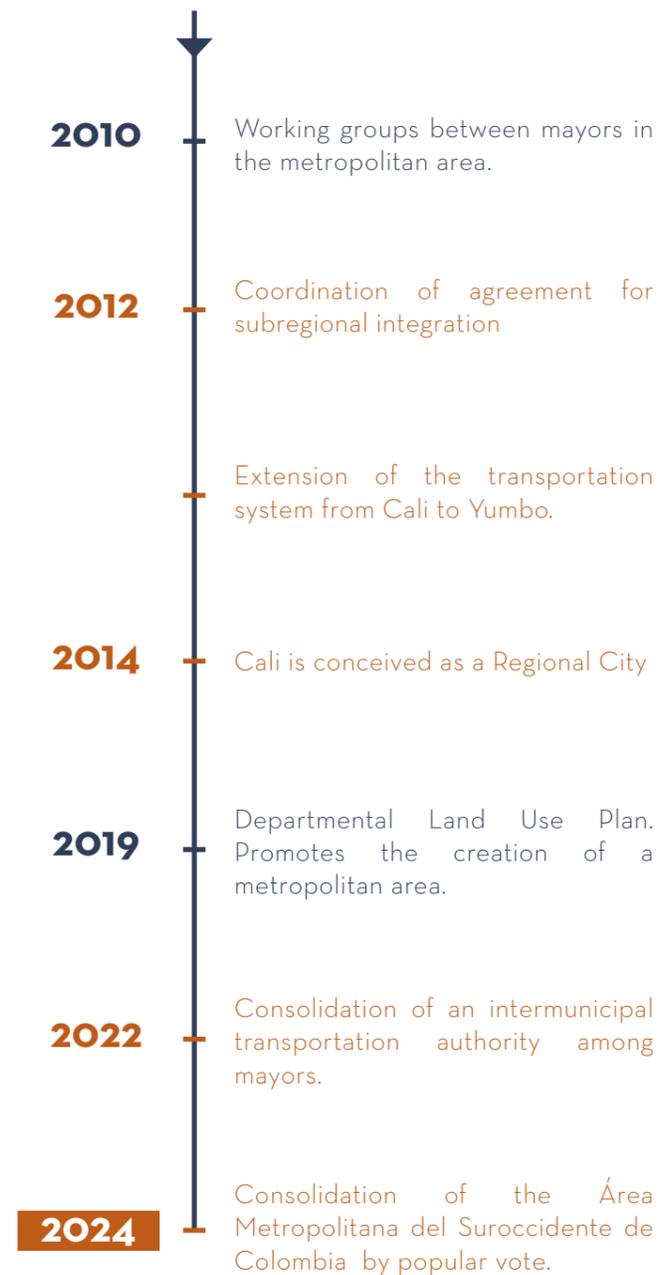
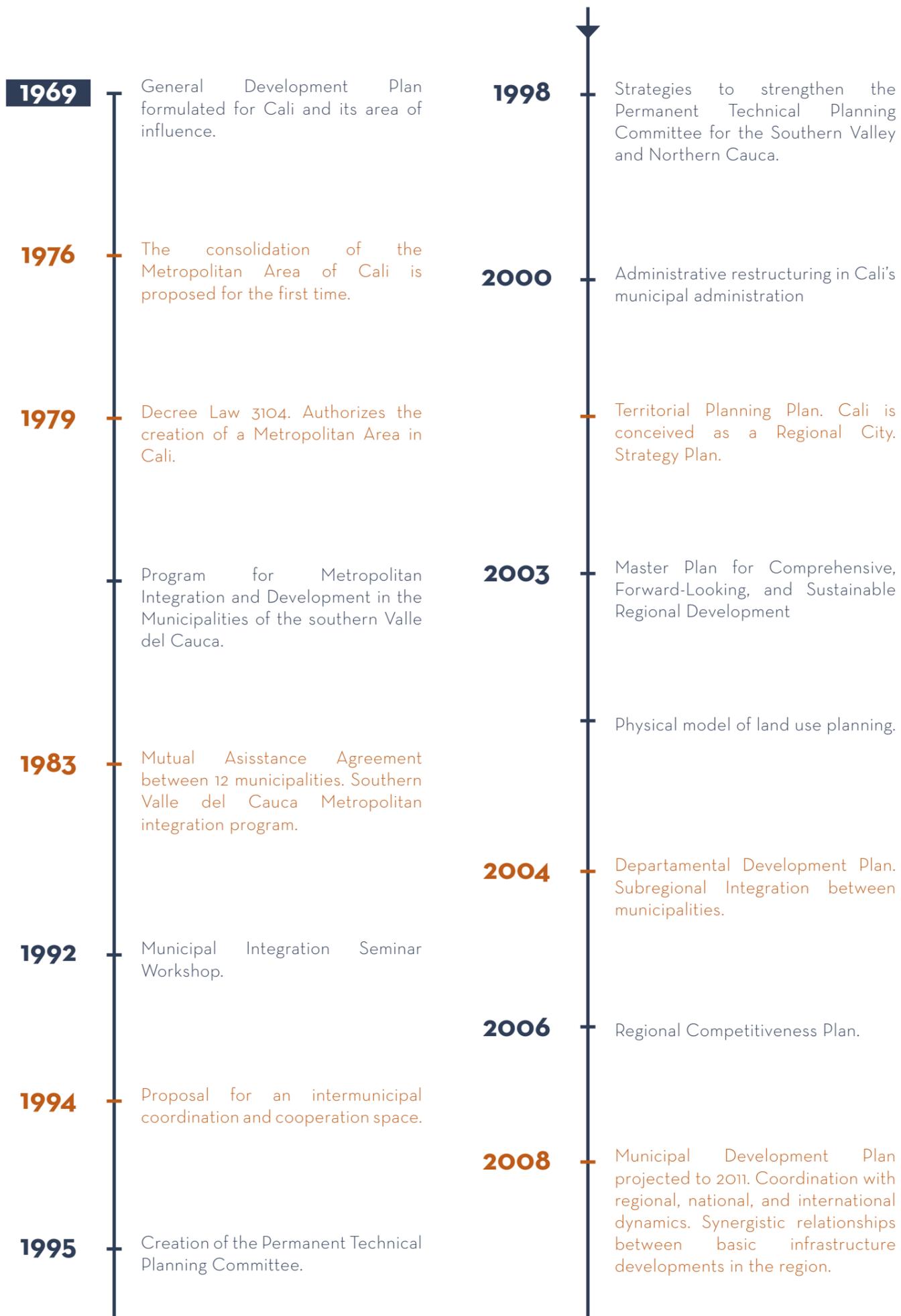


Figure 4 - Urban print growth of the Metropolitan Area. | Source: Author's elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)



■ Most Relevant Dates for AMSO's consolidation

Figure 5 - AMSO Integration Process Timeline. | Source: Author's own elaboration with data from Documento Técnico De Soporte Para La Constitución Del Área Metropolitana Del Suroccidente De Colombia (Alcaldías del AMSO 2024).

Its importance is also evident in the evolution of the territorial footprint of the different municipalities. Between 1964 and 2020, a process of accelerated and constant urbanization can be observed. Cali shows the most significant growth, expanding continuously and consolidating itself as the region's primary nucleus, while municipalities such as Jamundí, Yumbo, and Candelaria display progressive expansion that suggests a process

of conurbation and greater metropolitan integration. Between 2014 and 2020, the most dynamic phase of urban growth was evident, with a notable increase in the occupied area of Jamundí and the consolidation of Yumbo as an industrial and residential pole. Overall, the evidence reflects intense pressure on the territory and underscores the need for metropolitan planning that allows for orderly and sustainable development (Galeano Loaiza 2019).

Although there have been numerous efforts to integrate Cali with neighboring municipalities in order to coordinate development and land-use planning policies, no decisive agreement has been reached. Figure 5 illustrates the historical evolution of political efforts to consolidate AMSO and regional coordination as a whole. The process began in 1976 with the Metropolitan Comprehensive Plan of Cali, in which the mayor's office formally proposed for the first time the structured consolidation of a metropolitan area. However, some municipalities expressed disagreement and filed lawsuits against the proposal, which prevented the first attempt from succeeding. Three years later, in 1979, the President of the Republic, through Decree Law 3104, officially authorized the creation of a metropolitan area for Cali. This decision encouraged the mayor's office to resume efforts, so that between 1984 and 2022, different governmental mechanisms were implemented to promote regional integration. During this period, strategies, seminars, and inter-municipal cooperation plans were developed, in addition to initiatives such as the expansion of the mass transit system (MIO³) and the creation of a regional transportation authority, to lay the foundations for true metropolitan coordination (Alcaldías del AMSO 2024).

³ MIO (Masivo Integrado de Occidente): acronym referring to Cali's public mass transit system, composed of buses operating through exclusive lanes and feeder routes. The English translation is Western Integrated Mass Transit System.

Challenges Faced by AMSO municipalities

The creation of the AMSO seeks to consolidate development as a region by strengthening intermunicipal cooperation to provide the population with better services. However, it faces a series of structural challenges that test the consolidation of balanced metropolitan governance. The most significant challenges to be addressed as a region lie in the fields of intermunicipal mobility, territorial and developmental inequality, metropolitan governance, ecosystem deterioration and urban expansion, as well as urban safety and planning.

The first and perhaps most perceptible challenge for citizens is the precariousness of

intermunicipal mobility. It is estimated that 4.3 million road trips are made daily between these municipalities (País 2024), motivated by work, education, healthcare, and even cultural services. Road infrastructure is insufficient, and public transportation lacks regional integration, generating severe traffic congestion, especially during peak hours. As shown in Figure 6, road connectivity between Cali and its surrounding municipalities is characterized by a limited and poorly integrated intermunicipal mobility infrastructure. For instance, in the cases of Cali-Jamundí, Cali-Candelaria, and Cali-Yumbo, access routes are either insufficient, weakly structured, or poorly defined within

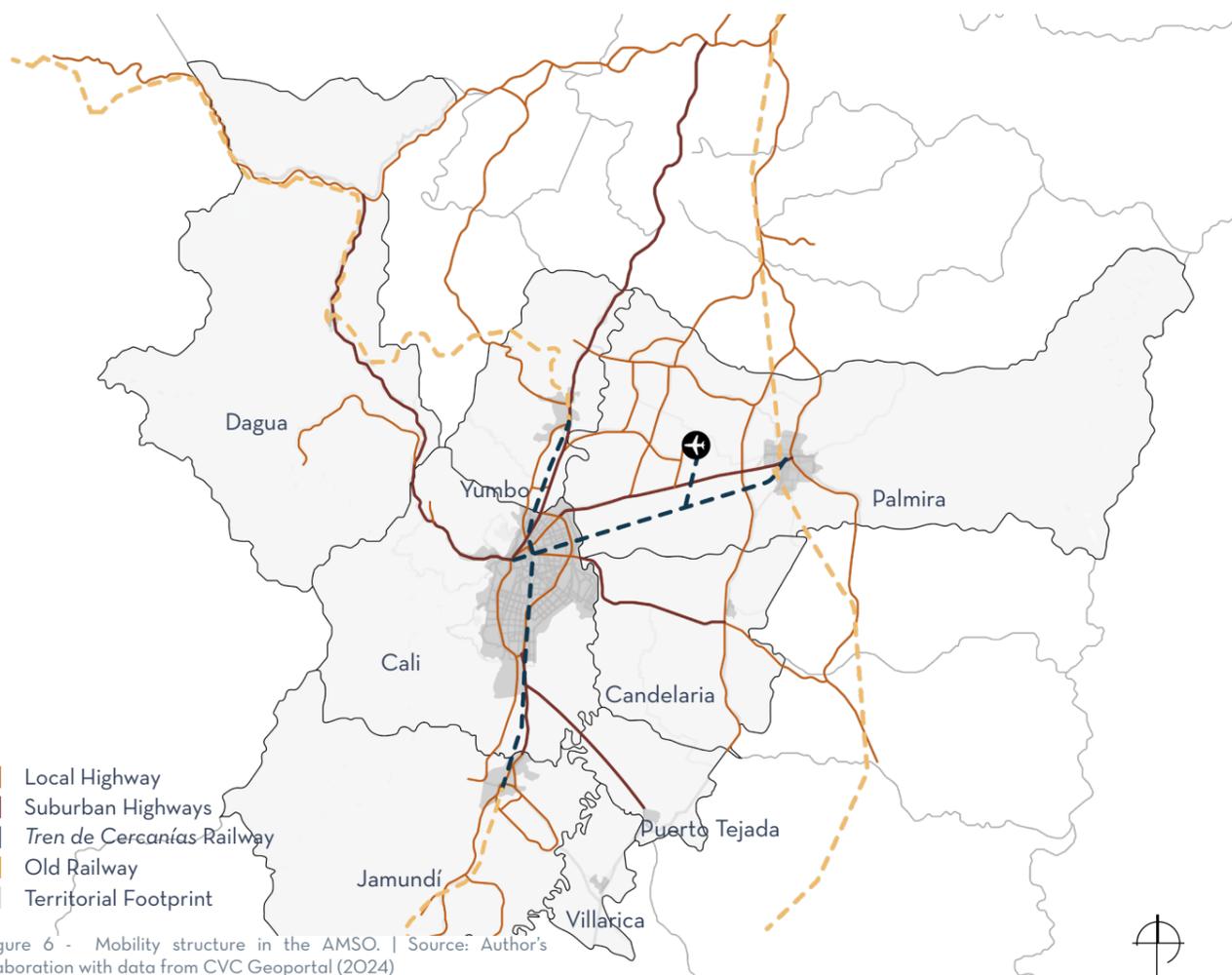


Figure 6 - Mobility structure in the AMSO. | Source: Author's elaboration with data from CVC Geoport (2024)

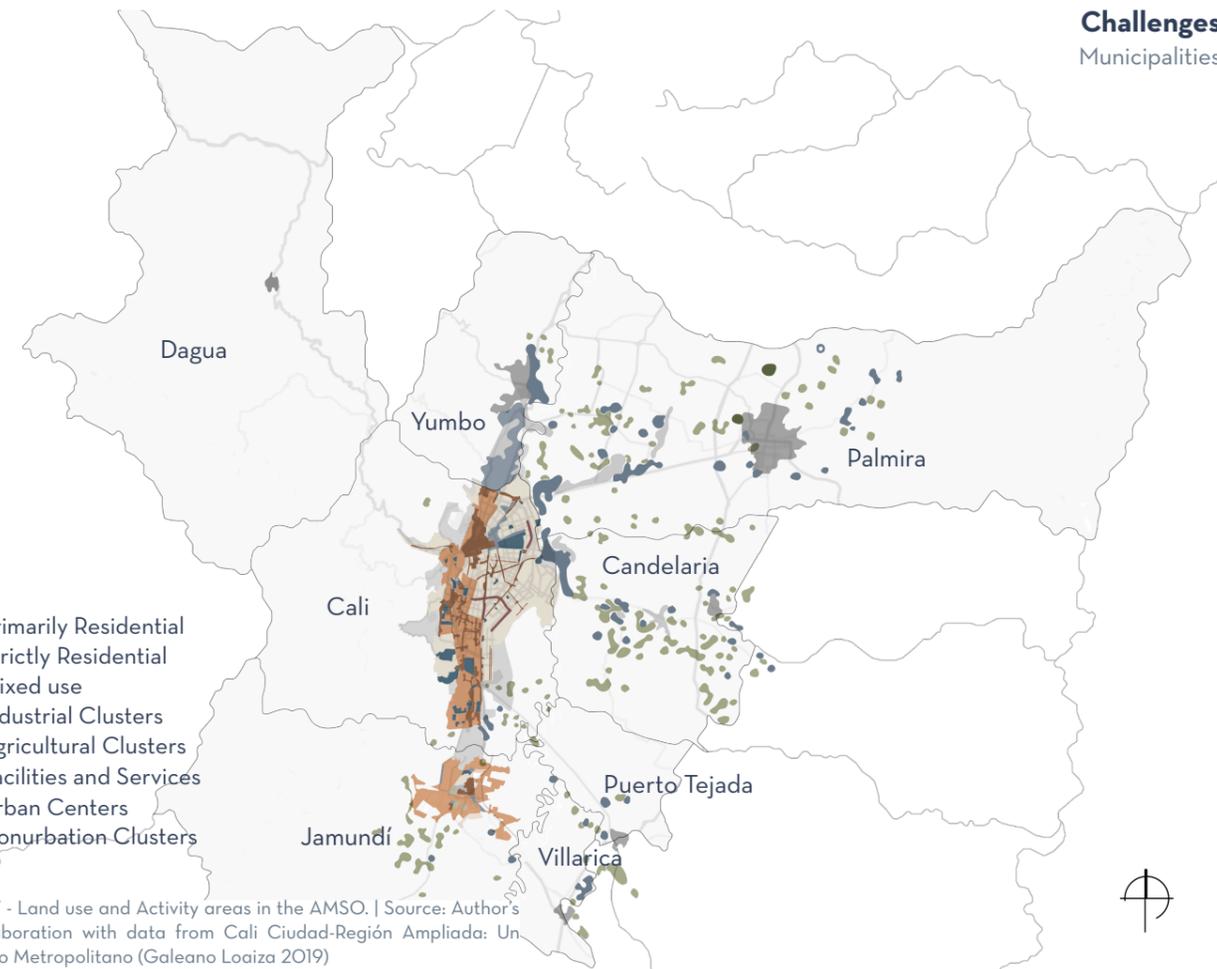


Figure 7 - Land use and Activity areas in the AMSO. | Source: Author's own elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)

the urban fabric, resulting in recurrent congestion and reduced efficiency of daily mobility. This situation not only limits the efficiency of daily mobility but also increases the social and economic costs associated with commuting.

Another central challenge is linked to territorial and developmental inequality. While Cali concentrates the majority of services, investments, and opportunities, peripheral municipalities often lack infrastructure, urban facilities, and basic services. For example, Figure 7 on land-use distribution shows that industrial activity is highly concentrated in the northern area near the Cali-Yumbo connection. In contrast, agricultural activity is more dispersed around Candelaria. The same figure illustrates that urban facilities are most concentrated within Cali's urban core. This dynamic creates patterns of functional dependence and fosters perceptions of inequity among inhabitants, who view the capital as the dominant core to the detriment of the other territories. In this regard, building a shared metropolitan identity

requires overcoming asymmetries in access to and quality of services.

On the environmental and public service front, the AMSO faces problems associated with ecosystem deterioration, pollution, and disorderly urban expansion. To begin with, the Cauca River, the main environmental and structural axis of the AMSO, is the principal recipient of pollutants as it passes through Cali and Yumbo, where more than half of the monitoring stations report extremely poor water quality (Figure 8). Integrated water resource management faces challenges related to supply, demand, quality, and risk (Ministerio de Ambiente, Vivienda y Desarrollo Territorial 2010): while strategic ecosystems (páramos, humid forests, forest reserves) play an essential role in water regulation, most of the allocated resource (64%) is destined for agriculture, compared to 26% for human consumption and 6% for industrial use, creating tensions between production and population supply (CVC Corporación Autónoma Regional del Valle del Cauca 2017). Added to this, there are problems

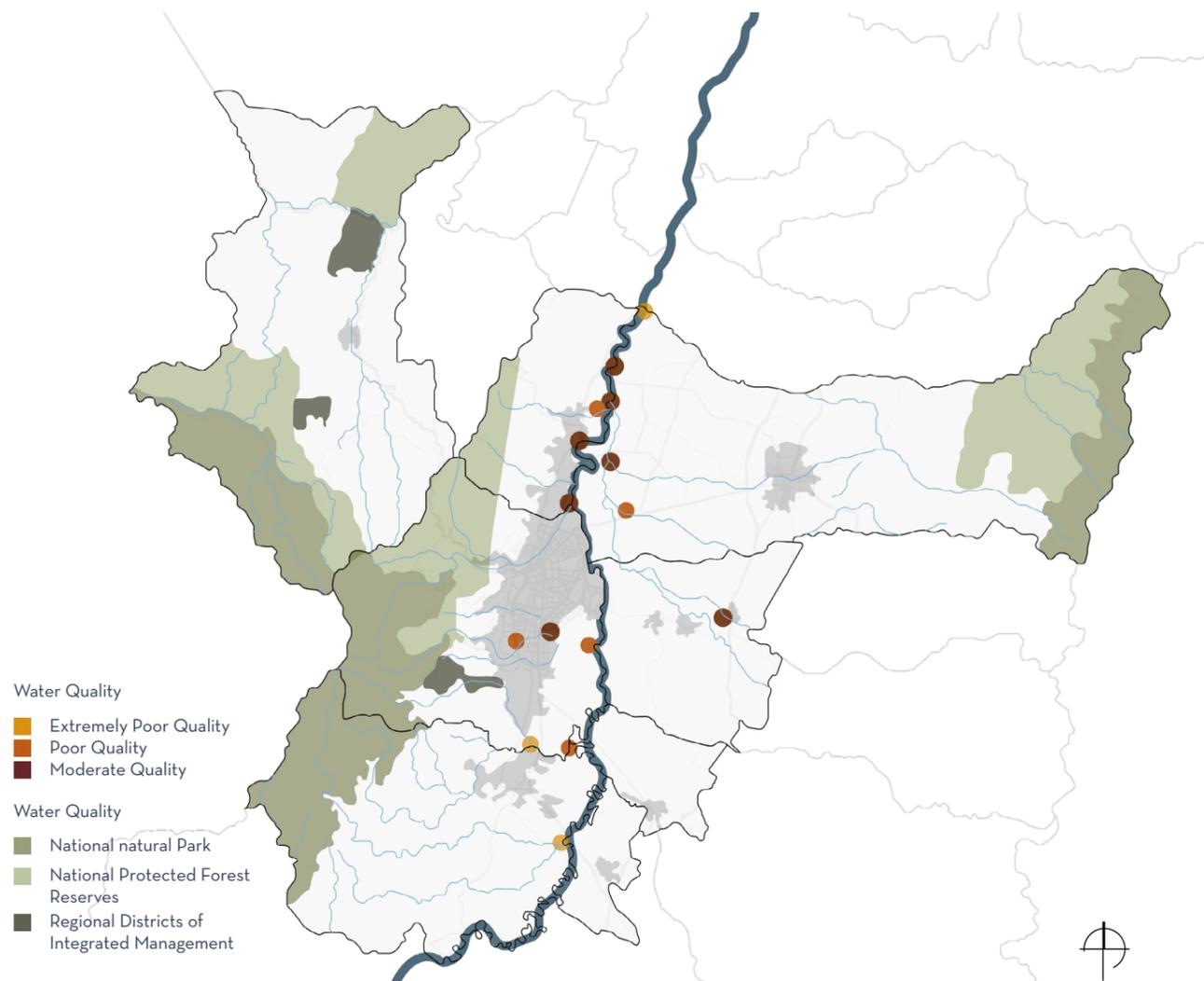


Figure 8. Water quality monitoring stations in the Cauca River and tributaries. | Source: Author's elaboration with data from CVC Geoportal (2024)

of obsolete aqueduct infrastructure, which causes losses of nearly 40% of captured water, and limited wastewater treatment capacity, which worsens river and stream pollution (AMSO municipalities 2024). In parallel, the territory is highly vulnerable to flooding from the Cauca River, due to urban occupation of risk-prone land and deficient management of hydraulic spaces. In this context, these issues require joint strategies that transcend political-administrative boundaries, while their implementation demands high levels of technical and financial coordination.

Finally, metropolitan governance also constitutes a challenge, as smaller municipalities fear a loss of autonomy relative to Cali, which may translate into

political resistance and difficulties in building consensus (Mesa 2024). This scenario becomes more complex due to the need to ensure effective citizen participation and democratic legitimacy in decision-making, as well as an equitable distribution of resources for financing strategic projects. At the same time, territorial planning remains fragmented, with disorderly peripheral urbanization that is increasingly dependent on Cali and makes the construction of a balanced metropolitan model more complex (Salazar 2024). These factors show that the success of the AMSO depends not only on legal formalization but also on the ability to face, in an integrated manner, the multiple challenges of mobility, equity, governance, sustainability, and safety.

The case of Jamundi and Cali

Statistics, Indicators and Key Issues



Figure 9 - Collage of news reports on traffic problems in southern Cali. | Source: Author's elaboration.

Of all the municipalities belonging to the AMSO, Cali and Jamundí in particular share a close relationship. This closeness is not only explained by their short distance of just 17 kilometers, but also by the way the dynamics of their inhabitants have increasingly overlapped in recent years due to their functional interdependence. This interdependence is especially evident to citizens in their daily lives, particularly when they need to travel between the two municipalities. Severe traffic problems are experienced mainly in the southern part of Cali and have been repeatedly reported in the media over the years, as shown in Figure 9. In this study, such interdependence is demonstrated through the analysis of land use and activity areas, the analysis of mobility

between the two cities, and the analysis of demographic and migration data within the region.

Figure 10 illustrates their relationship in terms of land use and activity areas. Residential areas—both strictly residential and primarily residential—predominate in both cities; however, in Jamundí, the strictly residential type is more prevalent. Mixed-use development—meaning properties that combine residential and commercial functions—in Cali is more widely dispersed throughout the city, primarily along the main road corridors, whereas in Jamundí it is concentrated in the city center. This suggests that even within Jamundí itself, citizens must travel to the center to access certain goods and services. Regarding facilities and services, it is expected that Cali would be better equipped, given its status as departmental capital and metropolitan core. However, it is important to highlight that in recent years the southern area of Cali, close to its connection with Jamundí, has seen a significant increase in facilities such as schools, universities, hospitals, and other services. Altogether, these elements suggest that southern Cali and northern Jamundí have been forming a continuous corridor of urban expansion, functioning as a transitional space that combines residential uses with commerce and support services. The high concentration of residential uses in Jamundí and facilities in Cali reinforces Jamundí's functional role as a commuter town strongly linked to Cali, though with some provision of local services and emerging internal centralities.

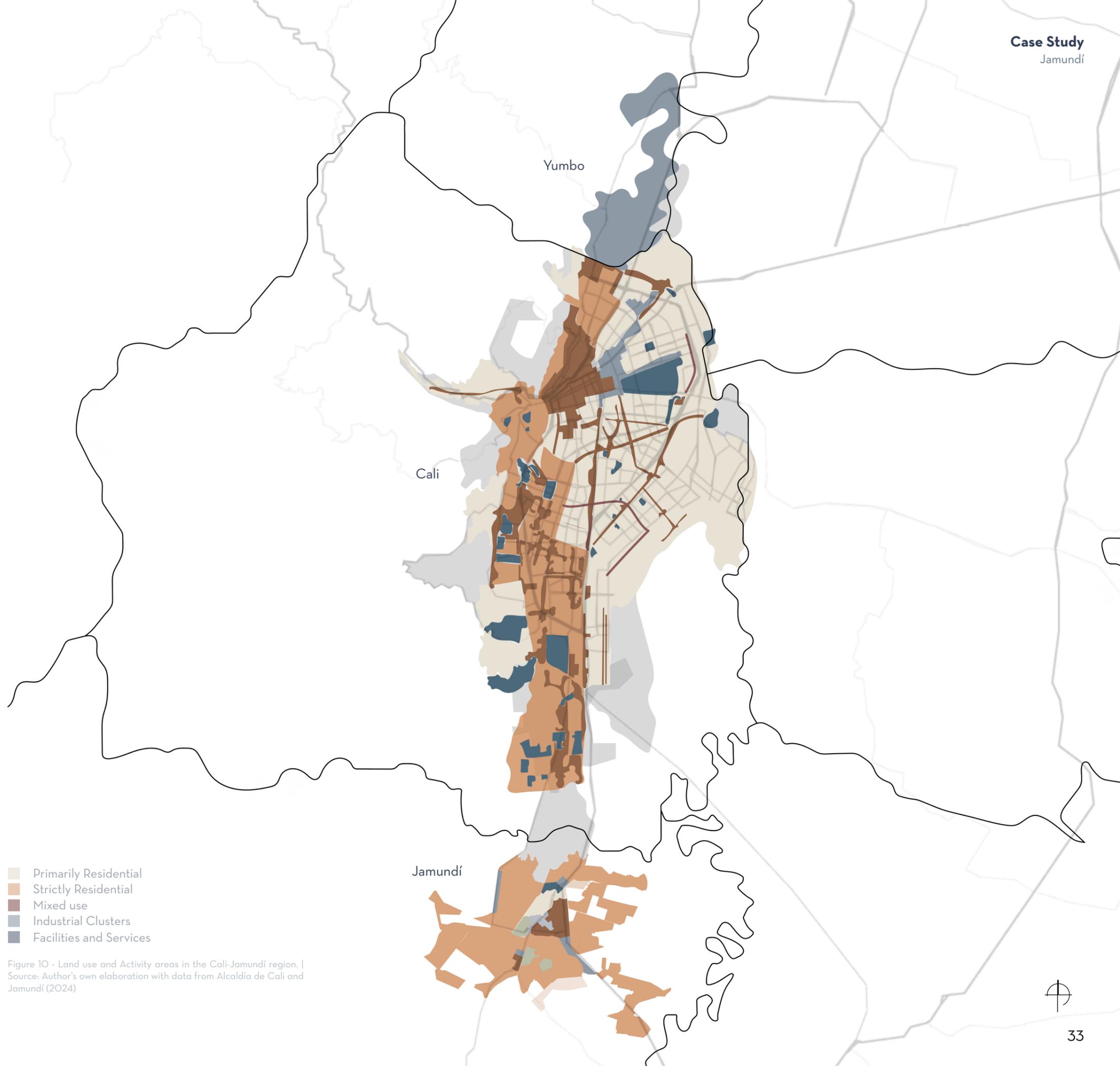


Figure 10 - Land use and Activity areas in the Cali-Jamundí region. |
Source: Author's own elaboration with data from Alcaldía de Cali and
Jamundí (2024)

Figure 11, on the other hand, illustrates their mobility relationship. At present, the backbone of this connection is the Cali-Jamundí road axis, or Panamericana Highway, which concentrates the majority of traffic flows and directly links the suburban residential areas of Jamundí with Cali. A secondary route leading into Jamundí also exists, though with lower capacity and therefore longer travel times. Within Cali, several highways and local streets are available, yet all converge on the main road axis, making the Cali-Jamundí connection particularly challenging. It is important to note that, at present, Cali's integrated mass transit system (MIO) does not reach Jamundí but only extends halfway along the route between the two cities. This has forced the population to rely predominantly on private vehicles, either cars or motorcycles, while those without access to private transport often resort to informal transportation. As a result, in recent years local authorities have acknowledged the urgent need for a public transport system capable of connecting Cali and its surrounding municipalities. In the past year, the commuter rail "Tren de cercanías" project was finally approved, designed to operate from south to north of the AMSO, collecting population from Yumbo and Palmira, passing through Cali, and reaching Jamundí. The proposal for a suburban rail line parallel to the highway not only responds to the need for mass transit capable of supporting daily commuting flows, but also leverages the existing railway infrastructure. This approach not only increases the sustainability of the project but also opens the possibility of restoring historic railway stations of material and cultural value.

Based on the findings collected in these maps, the functional relation between Cali and Jamundí can therefore be described as a linear corridor of urban expansion where residential uses predominate. Cali concentrates the majority of metropolitan-scale facilities, employment, and services, while Jamundí primarily consolidates as a commuter town with incipient centralities associated with mixed uses and local facilities. This dynamic

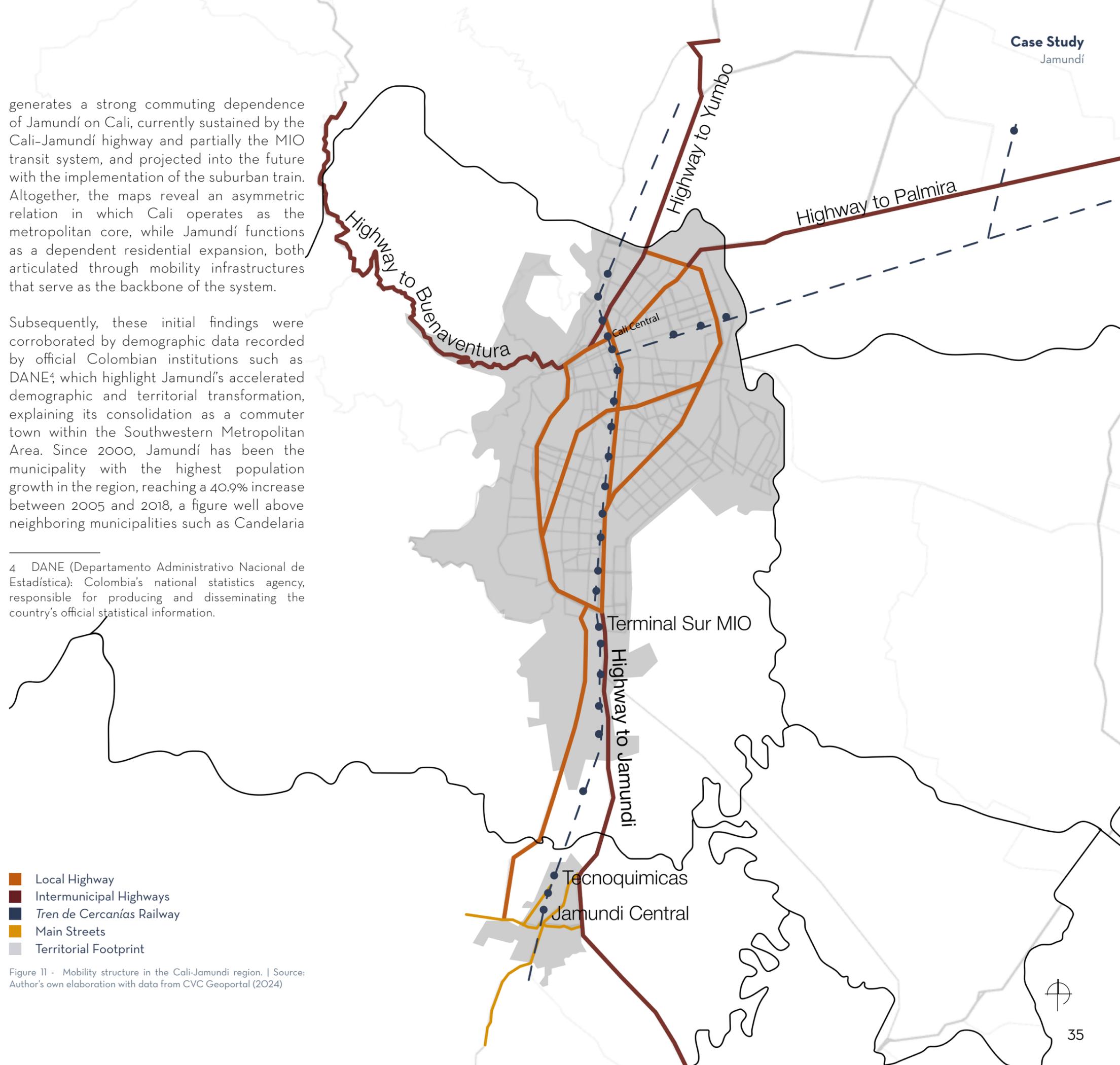
generates a strong commuting dependence of Jamundí on Cali, currently sustained by the Cali-Jamundí highway and partially the MIO transit system, and projected into the future with the implementation of the suburban train. Altogether, the maps reveal an asymmetric relation in which Cali operates as the metropolitan core, while Jamundí functions as a dependent residential expansion, both articulated through mobility infrastructures that serve as the backbone of the system.

Subsequently, these initial findings were corroborated by demographic data recorded by official Colombian institutions such as DANE⁴, which highlight Jamundí's accelerated demographic and territorial transformation, explaining its consolidation as a commuter town within the Southwestern Metropolitan Area. Since 2000, Jamundí has been the municipality with the highest population growth in the region, reaching a 40.9% increase between 2005 and 2018, a figure well above neighboring municipalities such as Candelaria

⁴ DANE (Departamento Administrativo Nacional de Estadística): Colombia's national statistics agency, responsible for producing and disseminating the country's official statistical information.

- Local Highway
- Intermunicipal Highways
- Tren de Cercanías Railway
- Main Streets
- Territorial Footprint

Figure 11 - Mobility structure in the Cali-Jamundí region. | Source: Author's own elaboration with data from CVC Geoport (2024)



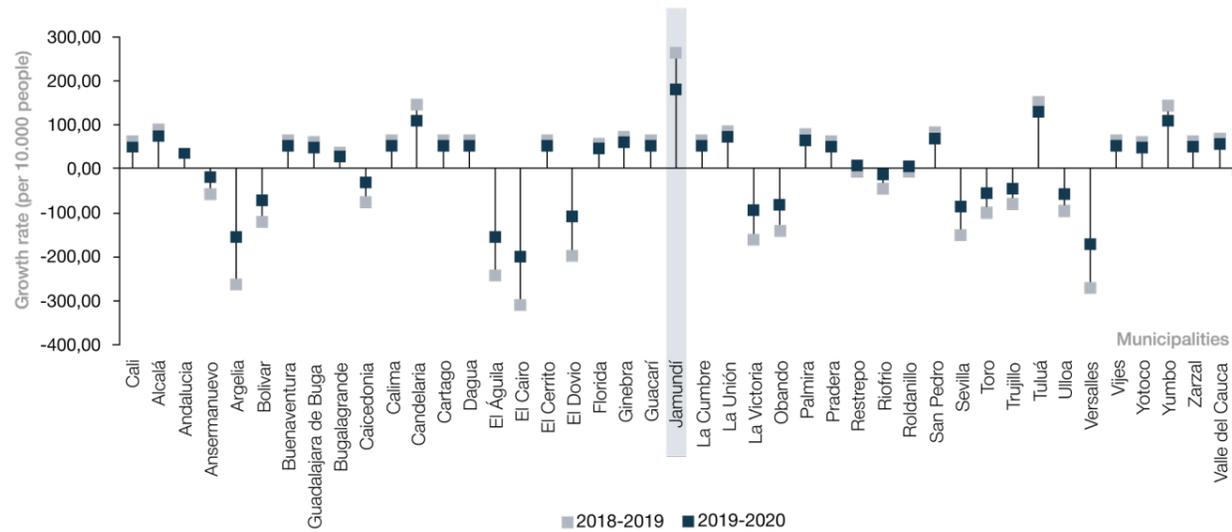


Figure 12 - Growth Rates x 10,000 People. | Source: Author's own elaboration with data from "La información del DANE en la toma de decisiones de los municipios del país - Candelaria, Jamundí, Palmira, Yumbo - Valle del Cauca" (DANE 2020)

(Alcaldías del AMSO 2024). This can also be seen in Figure 12, which shows Jamundí's population growth rate for 2018-2019 and 2019-2020, periods during which it doubled that of most other municipalities. According to DANE data, this growth is not only the result of natural dynamics but is mainly driven by migration. Figure 13, for instance, shows the flow of people moving between metropolitan cities—whether by place of birth, since 2012, or since 2017—always highlighting the Cali-Jamundí corridor as the most significant.

The most decisive factor encouraging this migration has been the availability of new housing, particularly social interest housing (VIS). While in 2011 Cali concentrated about 67% of the regional VIS supply, by 2021 its

share had dropped to 40%, with a clear shift toward peripheral municipalities. In this context, Jamundí increased its share from just 11% in 2011 to three times that amount by 2021, establishing itself as a residential alternative to the south of Cali (see Figure 14).

Furthermore, mobility data confirms the high degree of pendularity between these two cities. Data collected from the book "Cali, ciudad-región ampliada: un territorio metropolitano" (Figure 15) shows that Jamundí records the highest proportion of its workforce commuting to Cali, confirming a pattern of significant labor outflow and low local employment attraction. Additionally, the same book provides the information for the maps in Figures 16 and 17 that illustrate, respectively,

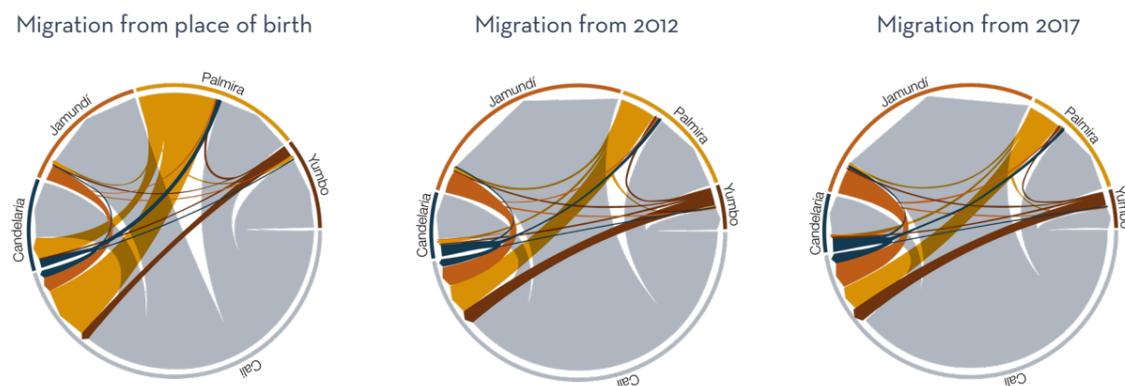


Figure 13 - Migratory flows between Cali, Candelaria, Jamundí, Palmira and Yumbo according to place of birth, place of residence five years ago, and one year ago. | Source: Author's own elaboration with data from "La información del DANE en la toma de decisiones de los municipios del país - Candelaria, Jamundí, Palmira, Yumbo - Valle del Cauca" (DANE 2020)

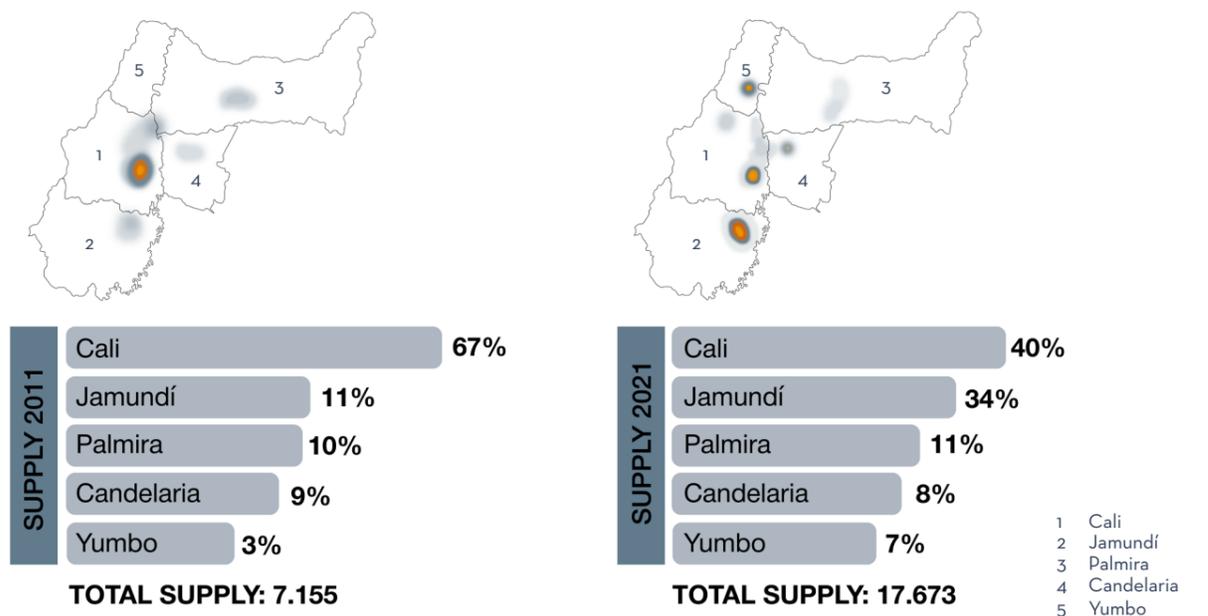


Figure 14 - Social Housing relocation in 10 years - 2011 to 2021. | Source: Author's own elaboration with data from on Alcaldías del AMSO (2024).

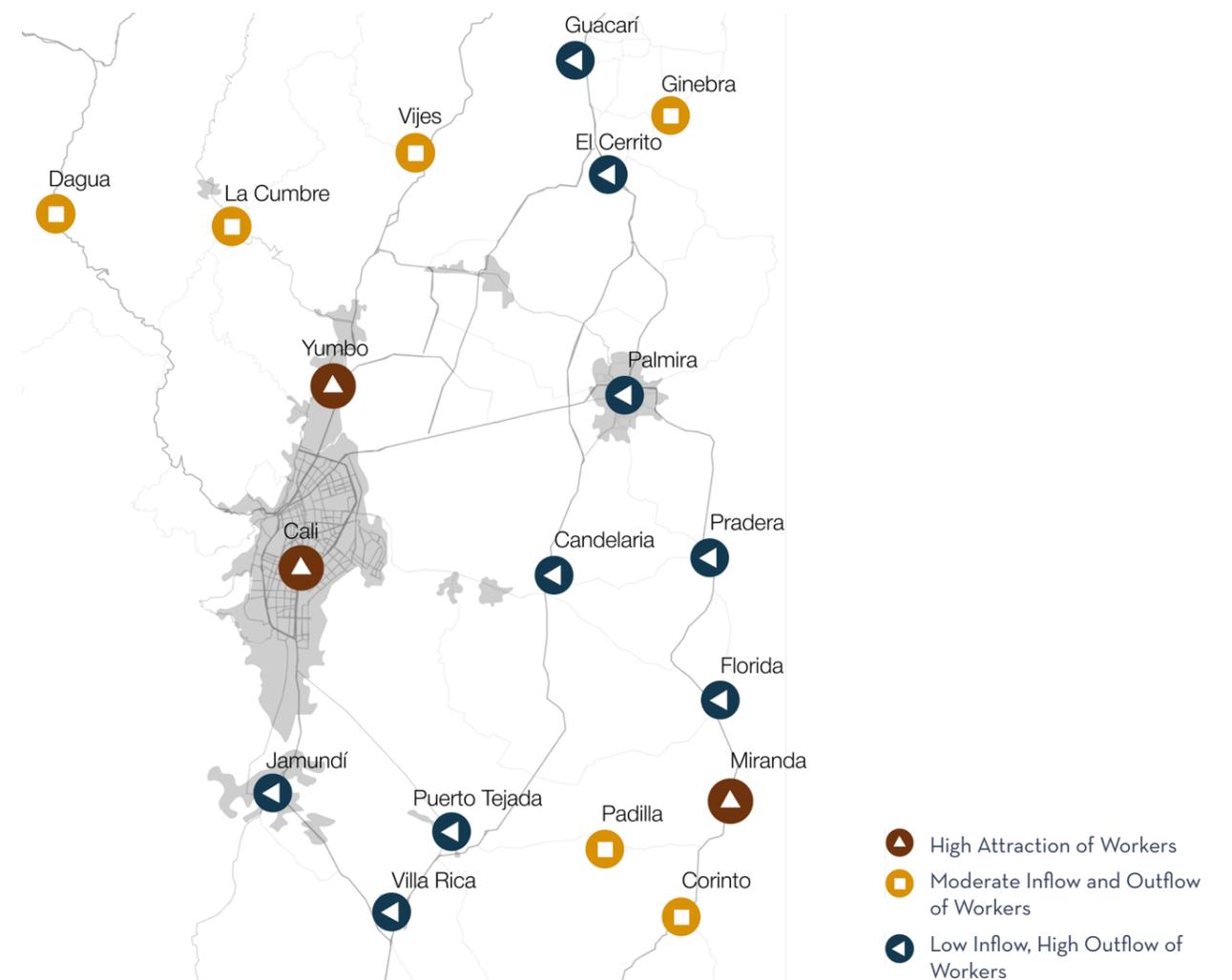


Figure 15 - Workforce commuting in the municipalities within the territorial space. | Source: Author's own elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)

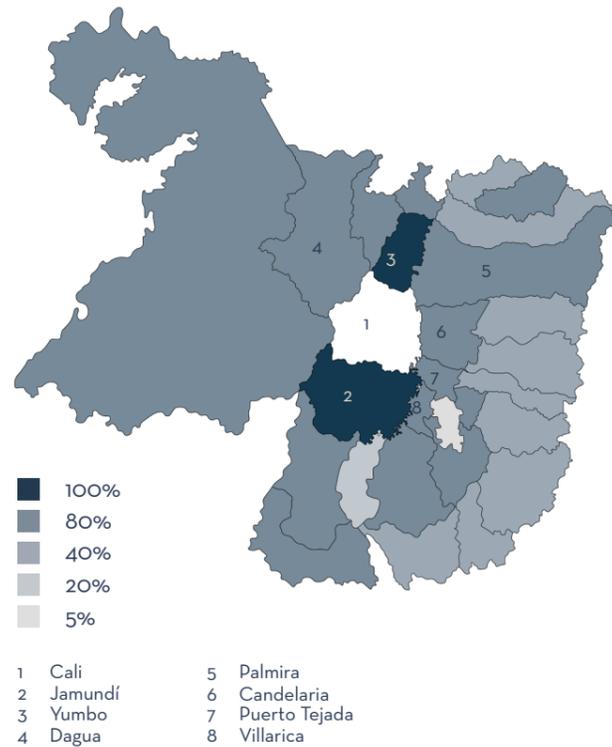


Figure 16 - Workforce commute to Cali by percentage. | Source: Author's own elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)

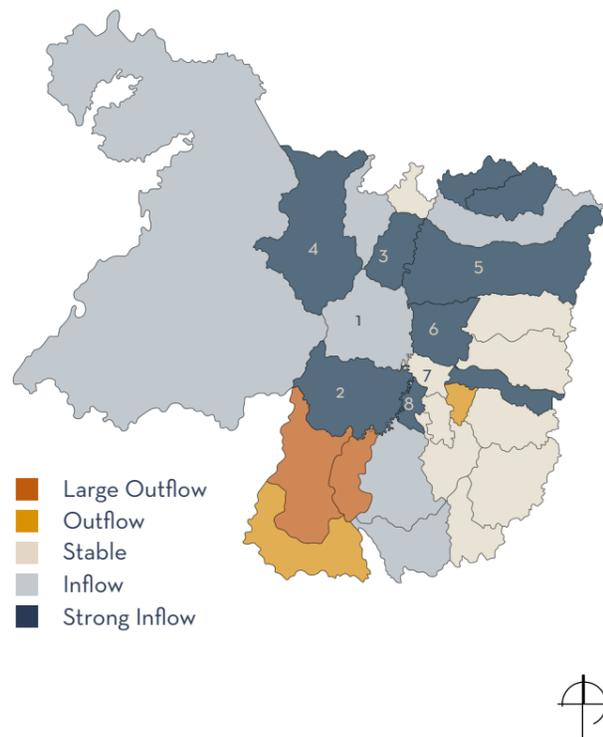


Figure 17 - Migration growth for work reasons. | Source: Author's own elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)

the percentage of the labor force commuting to Cali—where Jamundí ranks high—and the growth of migration for work-related reasons, with Jamundí experiencing a strong inflow of people. Finally, citizen perception surveys, such as the one presented in Figure 18, reveal that a large share of Jamundí's population travels to Cali in search of employment opportunities, education, specialized services, and even leisure.

Altogether, these indicators demonstrate how the convergence of three factors—accelerated population growth driven by migration, relocation of housing supply toward Jamundí, and functional proximity to Cali—has consolidated the municipality as a commuter town. While residents find in Jamundí an attractive and affordable housing market, they remain structurally dependent on Cali to access jobs, metropolitan services, and specialized facilities, thereby reproducing a pattern of commuting mobility and functional dependence within the metropolitan system.

254
CITIZEN PERCEPTION
SURVEY JAMUNDÍ 2023

To which neighboring city or municipality do they move?



Main reasons for moving outside the municipality



Figure 18 - Citizen perception survey in Jamundí | Source: "Encuesta de percepción ciudadana en Jamundí" (Yanhaas and Cali Cómo vamos 2023)

Tren de cercanías

The project and historical events

The AMSO is strategically located near the port of Buenaventura, Colombia's main maritime connection point on the Pacific Ocean. This location has historically consolidated the region as a key node for import and export trade, fostering industrial, commercial, and service development in Valle del Cauca.

Although today the Buenaventura-Cali corridor is traversed daily by numerous transportation companies, this reality was far from that of the nineteenth century. At that time, the connection between Buenaventura and Colombia's interior was limited by difficult geographical conditions and the absence of adequate infrastructure, which increased costs and slowed the transport of goods.

It was not until 1872 that the historic Pacific Railroad project was launched, conceived to connect Buenaventura directly with Cali. Although the work took nearly 37 years to be completed, it profoundly transformed the region by consolidating a network that would extend toward Popayán, Cartago, and Córdoba, creating a railway system that more efficiently integrated the southwest with the rest of the country. The inauguration of the railroad turned Valle del Cauca into a strategic enclave for the national economy, driving the establishment of industries, the growth of services, and subsequent population increases. These factors laid the foundation for the urban expansion of Cali and its later consolidation as the principal economic and logistical center of southwestern Colombia (Centro Virtual Isaacs "El Ferrocarril del Pacífico," n.d.).

Despite the progress represented by the construction of railroads in Colombia, inadequate administrative management by the State undermined the functioning of the networks, hindered their maintenance, and

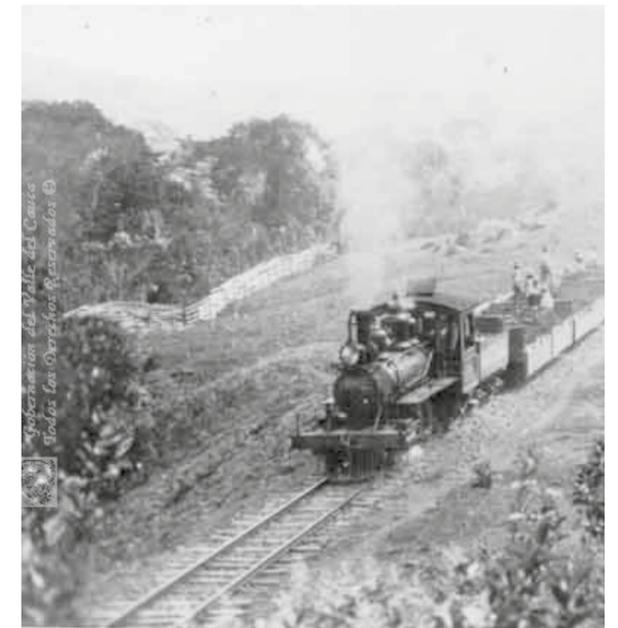
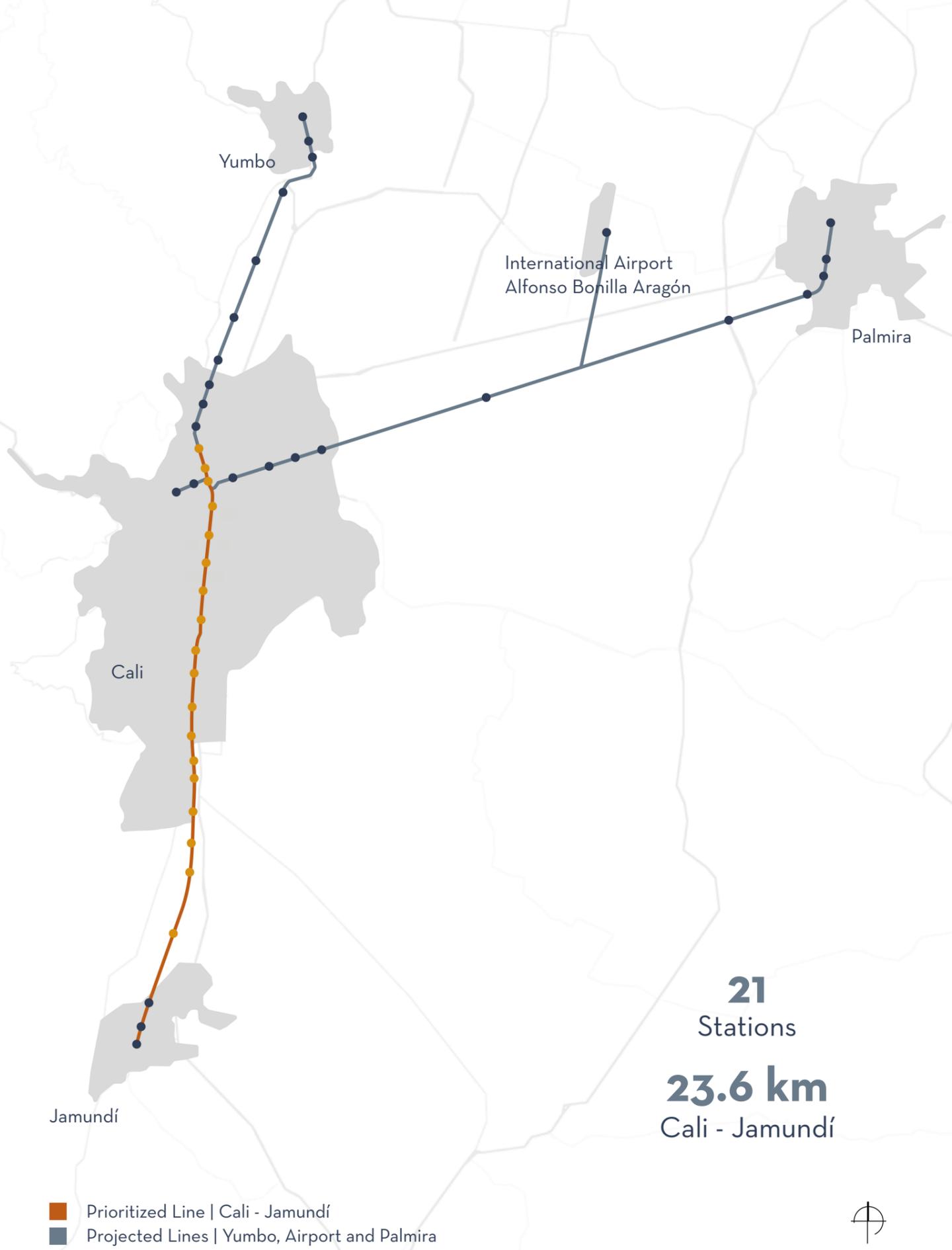


Figure 19 - Historical Image of the Pacific Railroad. | Source: Universidad ICESI. Ferrocarril del Pacífico, paso del tren en la vía férrea Cali - Popayán (Digital Photo). <https://audiovisuales.icesi.edu.co/handle/123456789/2744>, 1997.

limited funding for new projects. As a result, in 1954 the railway system entered a stage of decline, progressively losing its relevance as a strategic mode of transport and becoming, to a great extent, a mere historical vestige.

In order to strengthen the region's transportation service and reuse part of the historically neglected railway lines, since the year 2000 the Government of Valle del Cauca has promoted the creation of the Tren de Cercanías⁵ del Valle. This regional mobility project is designed to improve connectivity between Cali and the surrounding municipalities. The initiative seeks to strengthen metropolitan integration and foster sustainable mobility through 100% electric trains. This new network will reduce travel times, facilitating safe and efficient

5 Tren de Cercanías del Valle del Cauca (Valle del Cauca Commuter Rail Project).



21
Stations
23.6 km
Cali - Jamundí

- Prioritized Line | Cali - Jamundí
- Projected Lines | Yumbo, Airport and Palmira

Figure 20 - Tren de Cercanías del Valle del Cauca Project | Source: Author's own elaboration with data from "Proyecto Tren de Cercanías del Valle del Cauca- TCV (Gobernación del Valle del Cauca 2023).

access to workplaces, educational centers, healthcare facilities, and recreational spaces (Alcaldía de Santiago de Cali 2024).

Currently, priority has been given to the construction of the first section, Cali-Jamundí, which will include 21 stations along the route. This initial phase represents the first step toward consolidating a regional transportation network aimed at transforming mobility in Valle del Cauca, promoting the integration of municipalities, and improving the quality of life of its inhabitants. The long-term vision of the commuter rail is to integrate AMSO's growth in a planned and sustainable way, enabling the population to move efficiently between urban centers, which in turn will boost economic development across the region. The commuter rail not only recovers historical infrastructure but also modernizes it to address contemporary challenges, consolidating itself as a key element for metropolitan integration in Valle del Cauca today (Gobernación del Valle del Cauca 2023).

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02

Theoretical References and Methodological Framework

Polycentric Urban Development

The 15-minute City

Transit-Oriented Development (TOD)

Radial Analysis Methodology

Case Study Analysis Based on Radial Methodology

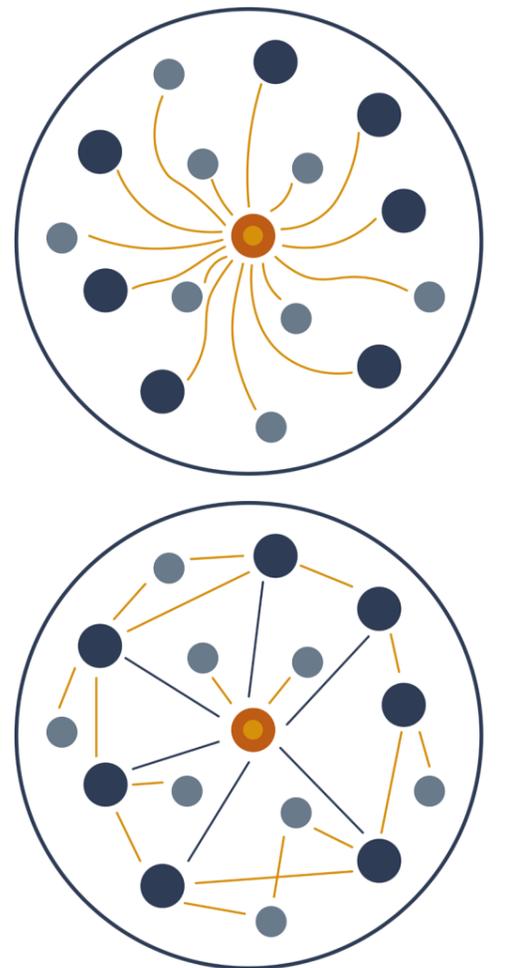
Recommendations

This chapter presents the primary theoretical references supporting the urban analysis of this thesis. The selected frameworks were identified through a prior analytical process and address metropolitan dynamics from complementary spatial scales. At the metropolitan scale, polycentric development explains processes of spatial expansion, functional interdependence, and centrality between Cali and its surrounding municipalities. At the neighborhood scale, the 15-Minute City highlights proximity to daily services as a condition for improving everyday mobility and urban quality of life. At the local and infrastructural scale, Transit-Oriented Development (TOD) informs the analysis of public transport systems and their role in structuring urban development and service distribution around transit nodes. Together, these frameworks provide a multiscalar and integrated understanding of metropolitan development challenges and opportunities in the AMSO.

Polycentric Development Metropolitan Scale

Polycentric development is a recomposition of the traditional monocentric city, where the population, services, and economic activities are concentrated around a single dominant urban center, creating a relationship of dependency between the center and the periphery. In contrast, the polycentric city functions as a system of nodes –multiple urban centers that, despite being interconnected and complementary through flows and functions, operate differently within the same metropolitan area (Beuf 2019). Mobility and service networks become systems of territorial articulation that allow connections between the centralities, reduce fragmentation, and permit more natural and accessible exchanges between different municipalities.

The territory is understood as a network of people flows and goods that promote a more balanced and sustainable metropolitan functioning. The idea of centrality is now understood as a social and functional perspective, not just as a physical point. In this sense, social interaction occurs across different places and scales, giving rise to a multiplicity of centers that coexist and constantly reconfigure themselves. This dynamic responds to processes of daily mobility, productive transformations, and changes in lifestyles, which expand the urban experience beyond the traditional center



● Third Urban Center
● Secondary Urban Center — Secondary Interaction
● Primary Urban Center — Primary Interaction

Figure 21 - Monocentric and Polycentric Development. | Source: Author's elaboration

and disperse it into a continuous web of relationships (Hall and Pain 2012).

The main goal of the polycentric development is to reach a more equitable distribution of opportunities, reduce pressure on traditional metropolitan centers, and create a more balanced territory. It looks to strengthen local capacities, provide municipalities with essential services, and increase employment opportunities for the population. The aim is not to generate urban dispersion that further fragments the territory and increases dependence on cars, but rather to plan a more organized reorganization of existing density and urban functions, or those a settlement needs.

In the context of Latin America, and as is the case with the AMSO, accelerated and uneven growth in the territory is a highly relevant reality (Pérez 2014). As mentioned in the introductory chapter on metropolitan areas, Cali has historically functioned as the city where most services and employment centers for the population of Valle del Cauca are concentrated, leaving surrounding municipalities such as Jamundí, Yumbo, and Palmira dependent on the dominant urban center.

Within the framework of this thesis, the polycentric city is assumed as a conceptual basis for metropolitan-scale analysis that allows for understanding and analyzing the role of new urban centralities in the regional system. Its consolidation in the surrounding municipalities enables the redistribution of functions and the balancing of the territorial structure, reducing commuter flows and strengthening local autonomy. Likewise, this approach allows us to recognize the potential of the Valle del Cauca Commuter Train project as a fundamental part of the metropolitan mobility network. The railway infrastructure becomes an operational tool for urban planning and design, capable of articulating mobility, centrality, and sustainable development, by connecting Cali with the surrounding municipalities.

The 15-Minute City Neighborhood Scale

The “15-minute City”, by Carlos Moreno, proposes an urban model that introduces a new way of understanding the contemporary city, based on accessibility and proximity, ensuring that all essential services are within walking or biking distance. Its main idea is to improve the community’s quality of life, reduce car dependence, and strengthen social interaction through a more humane, diverse, and sustainable environment. In this sense, urban efficiency is no longer measured by speed or expansion, but by proximity, mixed

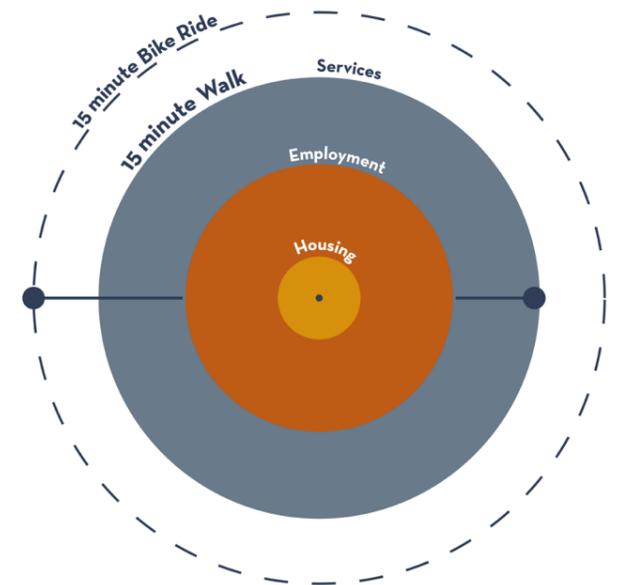


Figure 22 - 15-minute City Uses Rings. | Source: Author's elaboration

use, and the integration of daily life into the territory (Moreno 2024).

This theory is based on four main ideas. The first one is proximity; it refers to how people can easily reach homes, services, and places to gather right in their own neighborhood. Secondly, diversity of uses, such as housing, shops, workplaces, and parks, so neighborhoods feel complete for the community. Thirdly, density is about having enough people and activities to support public transport and local services nearby without spreading out too much. Lastly, digitization, focused on

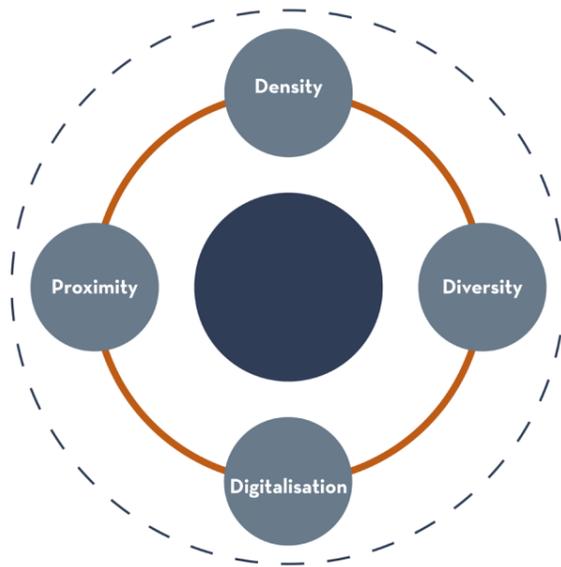


Figure 23 - 15-minute City Pillars . | Source: Author's elaboration with data from Introducing the "15-Minute City" (Moreno et al. 2021)

the technological aspects of the city, allows people to perform essential activities without travelling too far and creates a more flexible relationship between space, time, and urban life (Moreno 2021).

This model also rethinks the meaning of mobility, understood as a way of relating to the environment, not just simply as movement. This kind of city prioritizes human well-being, promoting an integrated urban life with equal access to basic services, and where moving daily becomes a part of the lifestyle (Moreno 2024). For this, transport infrastructure has to be no longer conceived as a technical support but rather as a system, an important element that connects experiences, times, and scales.

Within the scope of this thesis, the 15-Minute City is adopted as a theoretical reference for the urban scale, focusing on proximity, mixed uses, and everyday accessibility. This approach provides a framework for evaluating whether services, facilities, and daily activities are distributed within walkable distances, contributing to more inclusive and livable urban environments and reducing functional dependence on longer trips.

Transit-Oriented Development (TOD)

Local Scale

Transit-Oriented Development (TOD), proposed by Peter Calthorpe in his book *The Next American Metropolis* (1993) and applied in various urban development plans in metropolitan areas around the world, is defined by its author as "a mixed-use community within an average 2,000-foot (approximately 500 meters) walking distance of a transit stop and core commercial area" (Calthorpe 1993, p. 41).

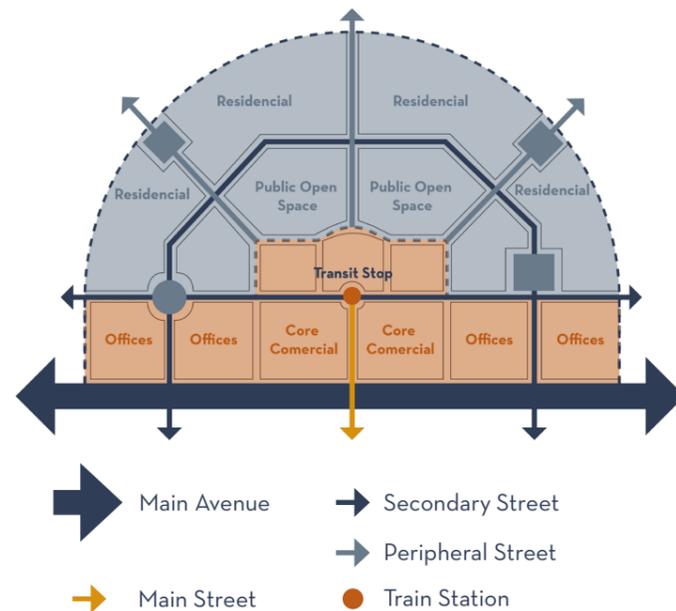


Figure 24 - TOD's Urban System. | Source: Author's elaboration with data from *The next American metropolis* (Calthorpe 1993)

This urban development model was conceived as an articulating node inside the city's structure, oriented towards generating more functional, decentralized, and pedestrian-focused urban environments through compact land-use planning, a diversity of services, and direct connections to public transportation networks.

Calthorpe also distinguishes between Urban TODs and Neighborhood TODs based on their scale and function within the urban system. The former correspond to high-density,

metropolitan areas located at connection points between different transportation systems, while the latter, on a neighborhood or local scale, promote smaller, more accessible communities structured around a station and with a strong pedestrian life.



Walking

Promotes safe and comfortable environments for pedestrians, prioritizing their mobility over that of cars.



Cycling

Promote continuous bike lanes connected to public transportation and urban facilities.



Connecting

Foster a permeable urban fabric with short, well-connected streets.



Transport

Ensure proximity to efficient public transport systems integrated into the city.



Mix

Integrate different land uses and social groups to promote diversity and inclusion.



Densify

Concentrate population, housing, and employment around transport corridors.



Compact

Promote growth towards the urban interior and avoid sprawl.



Change

Reorganize public space and the road network to prioritize sustainable modes and reduce private car use.

Figure 25 - TOD's Principles. | Source: Author's elaboration with data from DOT Estándar V 3.0 (ITDP 2017)

Over time, the TOD concept has evolved to respond to new urban and environmental challenges. From a theoretical proposal focused on the design of compact communities, it has become an international standard for sustainable planning. Based on Calthorpe's ideas, the Institute for Transportation and Development Policy (ITDP) redefined the model as a global strategy integrating sustainable mobility, social equity, environmental efficiency, and the quality of public space (ITDP 2017). With these updated standards made by the institute, new principles were established to build cities in harmony with their communities and their surroundings:

These principles reaffirm Calthorpe's vision of the need to link transportation, density, and urban diversity, and to expand its range to incorporate social and environmental dimensions (Calthorpe 1993). With this in mind, transportation becomes an essential urban tool that structures growth, promotes sustainability, and balances economic development with collective well-being, and is no longer understood just as infrastructure. On a metropolitan scale, using multiple interconnected nodes, each station or node functioning as a complementary center within a larger system, allows the formation of polycentric urban structures.

Within the framework of this thesis, Transit-Oriented Development (TOD) is assumed as a theoretical and methodological reference at the local scale, enabling the analysis of areas surrounding transport stations as potential anchors for compact, mixed-use development. Together with the metropolitan perspective of polycentric development and the urban-scale principles of the 15-Minute City, TOD supports a multiscale understanding of how transport infrastructure, land use, and service distribution can contribute to the consolidation of more autonomous, balanced, and connected urban settlements. This integrated theoretical framework directly informs the methodological approach and case study analyses developed in the following chapters.

Radial Analysis Methodology

Urban Analysis

The Radial Analysis methodology was developed to identify and evaluate the distribution of land uses and services within the area of influence surrounding a train station. Rather than being derived from a pre-existing methodological reference, this approach was constructed specifically for this thesis by integrating key concepts from the theoretical framework, particularly polycentric development, the 15-Minute City, and Transit-Oriented Development (TOD). These theories provide complementary principles related to proximity, accessibility, centrality, and functional diversity, which inform the structure and logic of the methodology.

The methodological design follows the overall research process and integrates the three selected theoretical approaches across different spatial scales. At the metropolitan scale, polycentric development guides the identification of areas with the potential to function as localized urban nodes. At the neighborhood scale, the circular analysis model responds to the concept of a 15-minute walking distance, corresponding to a radius between 500 and 700 meters. At the local and infrastructural scale, and in accordance with TOD principles, the train station is selected as the central reference point of the analysis due to its role in structuring mobility and supporting walkable urban development.

The procedure for applying the methodology consists of four main phases. The first phase involves the selection of train stations with high relevance at both the urban and regional scales, prioritizing those that operate at a higher hierarchical level within the transport network and concentrate multiple routes and passenger flows. The second phase defines a circular perimeter with a radius of 500 to 700 meters around each station, representing a walkable catchment area. The third phase consists of identifying and classifying land

uses and services within this area of influence, based on field observation, satellite imagery, maps, and street-level analysis. Identified uses are categorized and represented graphically to allow for comparative analysis. The fourth phase evaluates strengths and weaknesses by contrasting the presence of amenities with existing service gaps.

The final outputs of this methodology include thematic maps illustrating the spatial distribution of uses and services, comparative matrices highlighting availability and deficiencies, and the identification of priorities for intervention. These results enable the recognition of patterns of urban functionality and potential synergies among different nodes.

Finally, it is important to note the scope and limitations of this methodology. While the analysis addresses multiple spatial scales, its contribution to architectural decision-making is indirect, as it informs the definition of uses and functional programs rather than building design. The method focuses on spatial and functional dimensions and does not incorporate qualitative or temporal aspects

variability. Nevertheless, it provides a clear and comparable framework for evaluating spatial accessibility⁶ and service distribution around transport nodes, serving as a foundation for the urban design and strategic development proposals discussed in later chapters.

such as pedestrian experience or travel time

⁶ Accesibility: The ease of reaching opportunities (jobs, services, activities) within a given time or distance.

Case Study Analysis

Based on Radial Methodology

Below are some case studies analyzed using the methodology described in this chapter. Strategic points were selected in the city of Cali, using various stations of the integrated mass transit system (MIO), as well as in the town of Jamundí, where the future planned stations of the Commuter Train were considered. It is important to remember that the central purpose of the methodology is to understand the distribution of activities and services in relation to public transport infrastructure, in order to assess the potential suitability of each area to serve as an urban center within the metropolitan system.

Radial Analysis of Selected Stations in Cali

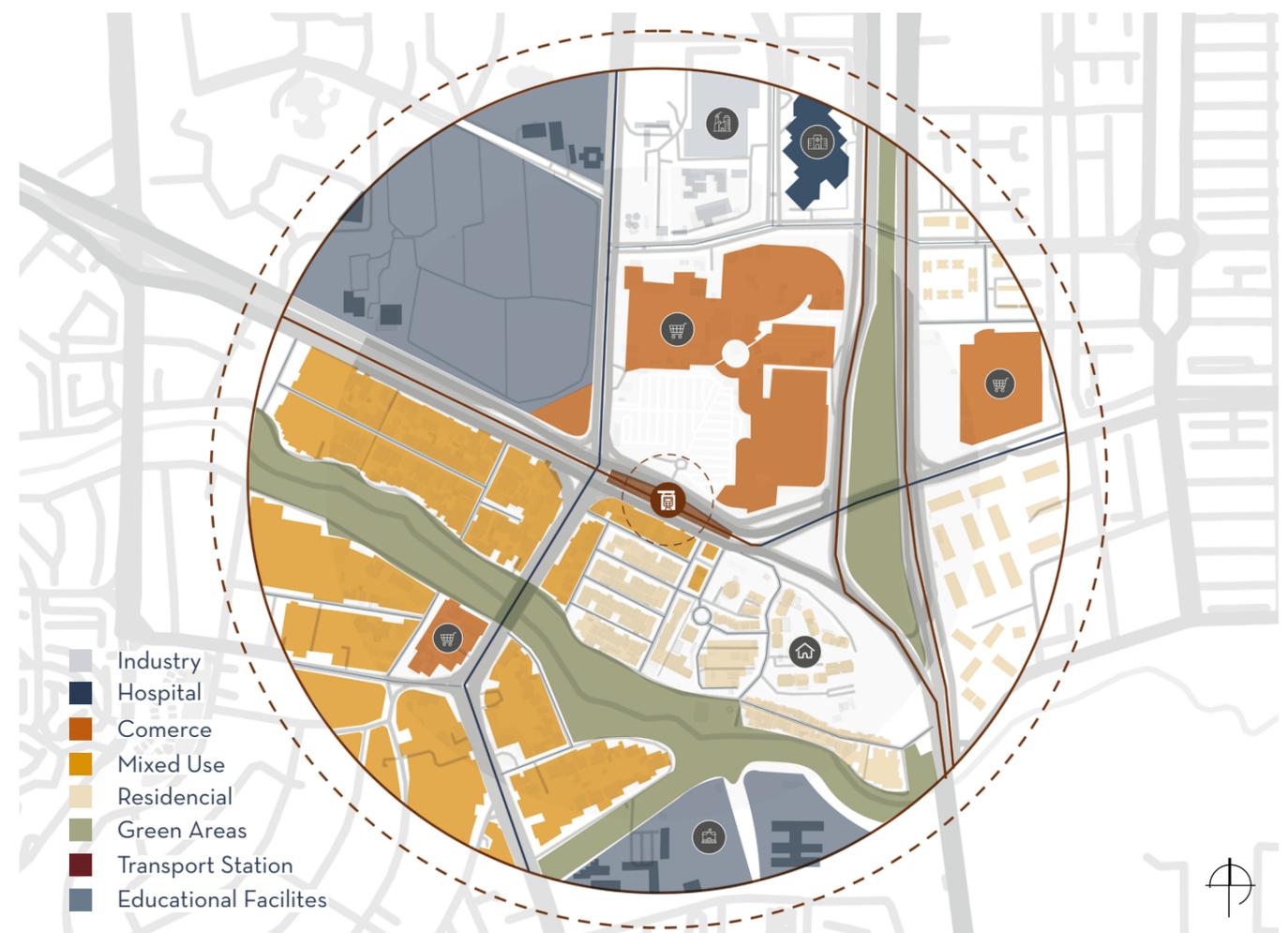


Figure 26 - Universidades MIO Station Analysis. | Source: Author's elaboration

The first case study, shown in Figure 25, corresponds to the area of influence of the MIO's Universidades Station, located in the southern sector of Cali. This station is located on Carrera 100, between Calle 16 and the Simón Bolívar Highway. Carrera 100 is a fundamental

structural axis within the city's road network, as it connects with Calle 5ª, the main road that crosses the urban territory from north to south through the western sector. In addition to its role in metropolitan connectivity, this artery has a historical dimension, as until

the 1990s it represented the southern limit of the consolidated urban area, marking the transition between the built city—to the north—and the areas of urban expansion—to the south (Plan Piloto/Atlas Histórico de Cali, 2020). On the eastern edge of the study area is the Simón Bolívar Highway, a road corridor that also crosses the city from north to south and connects with the Pan-American Highway, the main link to the south of the country. In turn, the area is intersected by Calle 16, a transversal axis that connects the central neighborhoods with the southern sectors, and whose relevance increased as a result of the urban expansion process beyond Carrera 100.

This high level of interurban connectivity gives the station a strategic role within Cali's functional structure, as it is the hub for several feeder and trunk routes connecting different

sectors with the south of the city. However, its importance goes beyond mobility: within the approximate 700-meter radius shown in the figure, there is a significant diversity of land uses—residential, commercial, mixed, educational, industrial, and health—evidencing a multifunctional environment that is well served in terms of accessibility and urban facilities.

According to the methodology applied, the area surrounding the station presents a set of characteristics that support its consideration as an urban center within the proposed system of centralities, particularly its high level of connectivity to the public transport network and the concentration of urban activities. However, despite this potential, the territory shows structural challenges that transcend the analytical scope of the methodology used.

These include recurrent traffic congestion, limitations in pedestrian accessibility and functional integration with the immediate environment, as well as deficiencies in the quality of infrastructure and public space (Administrative Department of Municipal Planning, 2020).

The second case study corresponds to the MIO Simón Bolívar Terminal Station (Figure XX), which operates at a larger physical and functional scale than the previous case. It was conceived as a terminal station, functioning as a starting and ending point for multiple trunk and feeder routes, and therefore concentrating a higher number of converging services. Its design promotes intermodality by connecting different modes of transport, such as articulated buses, standard buses, bicycles, and inter-municipal transport. The station is located along the Simón Bolívar Highway, one of Cali's main north-south corridors in the eastern part of the city, and at Carrera 66, a road that collects traffic from several central neighborhoods.

It should be noted that this station is located at a transition zone between sectors associated with different socioeconomic conditions. In the Colombian context, residential areas are classified into socioeconomic strata ranging from 1 to 6, a system used to determine the cost of public utilities and, in some cases, access to health and educational services. To the east of the station, low-income neighborhoods predominate, primarily classified within strata 1 and 2, while to the west, middle-income neighborhoods corresponding mainly to strata 3 and 4 are located.

This spatial contrast reflects broader historical patterns of urban development in Cali. The eastern sectors of the city largely emerged through informal settlement processes, including land invasions and subsequent phases of state-led regularization, often facilitated by informal urbanization practices. In this sense, urban development in the surroundings of the station holds the potential to act as a catalyst for social integration, contributing to the

mitigation of long-standing dynamics of spatial and socioeconomic segregation within the city.

The application of the radial methodology reveals that the station's area of influence is characterized by a predominantly residential and mixed-use urban fabric, with a clear spatial differentiation between its eastern and western sectors. The western sector is mainly composed of private residential complexes with limited and spatially segregated commercial uses, resulting in a more mono-functional pattern with fewer opportunities for everyday services within walking distance. In contrast, the eastern sector presents a finer-grained urban structure dominated by single-family housing, where ground-floor commercial activities are frequently integrated into residential buildings, supporting local livelihoods and everyday needs. Within the area of influence, the presence of commercial establishments, a hospital, a public recreation facility, and several neighborhood parks introduces localized service anchors that complement the residential fabric. Although located slightly beyond the 700-meter radius, the Mariano Ramos sports complex to the north functions as a significant recreational facility, reinforcing the area's role as a node for social and recreational activities.

Building on the results of this analysis, it is proposed that the immediate surroundings of the station could accommodate additional uses that are currently underrepresented within its area of influence. In particular, the absence of educational facilities at different levels suggests the potential incorporation of primary, secondary, and higher education uses. In terms of commercial activity, the analysis indicates a predominance of small-scale and informal commerce, pointing to the opportunity to introduce more structured and consolidated commercial uses that could complement existing local activities. These additions, combined with community and cultural facilities, could contribute to strengthening the functional diversity and urban dynamics of the area, supporting its potential role as a localized urban center.



Figure 27 - Simón Bolívar MIO Terminal Station Analysis. | Source: Author's elaboration

Radial Analysis of Selected Stations in Jamundí



- 1 Station 19
- 2 Station 20
- 3 Station 21



Figure 28 - Stations Location. | Source: Author's elaboration

The three following case studies analyzed are located in the municipality of Jamundí (Valle del Cauca) and correspond to the three stations planned as part of the Valle del Cauca Commuter Train. The first study area is associated with the SENA⁷ institution, planned for the north of the municipality, on Avenida Sachamate, as illustrated in Figure 28. This recently completed avenue is part of a large-scale urban road infrastructure project designed to strengthen connectivity and guide the urban growth of Jamundí. Its planning responds to the purpose of promoting the consolidation of new residential and commercial developments, while seeking to decongest the urban center and avoid expansion concentrated exclusively in the historic core (Diario de Occidente 2016).

In this case, the station was not considered the central point of the area of influence, as its boundaries partially overlapped with those of the next planned station. In order to broaden the scope of the territorial analysis, the circular area was shifted slightly to the north. The land use analysis (Figure 29) identifies a predominantly residential and mixed-use structure, complemented by the presence of industrial activities and educational facilities. This sector has high potential for transformation, especially through the incorporation of a business or office center that articulates existing productive dynamics. Likewise, the introduction of higher education, technical, or technological facilities linked to the surrounding industries could contribute to consolidating an urban-industrial development hub in this area.

7 SENA: Servicio Nacional de Aprendizaje (National Training Service) is a public institution in Colombia that provides technical, technological, and professional training for workforce development.



Figure 29 - Station 19 Analysis. | Source: Author's elaboration

The second station under study (Figure 30), called Station 20, will be located at the intersection of Carrera 14 and Calle 15a. This intersection is home to a multifunctional urban block that integrates various community facilities such as a sports field, a sports center, a recreational park, and an educational institution. The immediate surroundings maintain a consolidated residential character, with commercial establishments on the ground floor of the buildings. As in the previous sector, this area could benefit significantly from the incorporation of structures that concentrate employment and services, such as a larger-scale commercial complex integrated with office space. There is a clear need to diversify the range of local services, with the aim of reducing residents' daily commutes and

strengthening the functional self-sufficiency of the sector. Similarly, the high population density suggests that the establishment of new sources of employment close to the place of residence could contribute to the development of a more balanced, compact, and sustainable urban model.

Finally, the third area of study corresponds to the Station 21 (Figure 31), which will be located near the old train station, currently adapted as a cultural center. This sector presents greater functional heterogeneity compared to the previous cases, showing a more significant presence of educational institutions and specialized commercial establishments. The main hospital of Jamundí and an industrial plant are located in the southern part of the



Figure 30 - Station 20 Analysis. | Source: Author's elaboration



Figure 31 - Station 21 Analysis. | Source: Author's elaboration

area, reinforcing the mixed nature of the environment. The Central Station benefits from its strategic location, as it is close to the urban center of Jamundí, where most of the commercial and service offerings are concentrated, including the main square and the market square. This condition positions it as an urban convergence point with high potential for functional and social integration.

Considering these characteristics, the sector could be strengthened by incorporating larger-scale cultural or educational facilities, or even a public library, to complement and expand the cultural activities currently taking place at the existing station. Likewise, given its proximity to the hospital, the feasibility of introducing higher education infrastructure has been identified, especially technical or

university programs related to health and medical sciences, which would take advantage of the existing territorial synergies.

In conclusion, the analysis of the case studies using the radial methodology demonstrated the usefulness of this approach for understanding the relationship between public transport infrastructure and the functional configuration of urban areas. The examples applied in Cali and Jamundí showed that the location of stations and their degree of connectivity are determining factors in the formation and strengthening of urban centers.

In the context of Cali, the areas of influence of the Universidades and Simón Bolívar stations of the MIO system have high accessibility and diversity of land uses, conditions that favor

their potential to consolidate themselves as urban centers on a metropolitan scale. However, limitations associated with traffic congestion, the quality of public space, and poor pedestrian connectivity were also identified, aspects that must be addressed to ensure more efficient and equitable urban integration.

For their part, the cases analyzed in Jamundí, linked to the future Valle del Cauca Commuter Train, show an opportunity to guide urban growth toward more compact, mixed-use, and sustainable models. The planned stations—Tecnológicas, Calle 15, and Central—have the potential to act as structuring nodes that articulate residential, productive, educational, and cultural activities, promoting polycentric development and greater functional integration

with the Cali metropolitan area.

Taken together, the results obtained reaffirm the relevance of the radial methodology as a tool for territorial analysis, as it facilitates the identification of spatial patterns and opportunities for urban intervention. They also highlight the need to complement this type of analysis with comprehensive planning strategies that take into account social, environmental, and sustainable mobility aspects, aimed at consolidating a balanced and resilient system of centralities at the metropolitan scale.

Recommendations

Conclusions

The purpose of this chapter was to establish the conceptual and methodological framework underpinning the analysis of the five case studies related to the future Valle del Cauca commuter rail system, covering strategic sectors in Cali and Jamundí. Based on the integration of three complementary theoretical approaches—polycentric development, the 15-minute city, and Transit-Oriented Development (TOD)—a radial analysis methodology was developed to evaluate the spatial distribution of uses and services within the areas of influence of selected and proposed stations.

The articulation of these approaches enabled the construction of a metropolitan vision grounded in proximity, accessibility, and functional diversity. Polycentric development provided a framework for understanding the role of stations as potential structuring nodes within a decentralized territorial system. The 15-minute city emphasized the importance of ensuring access to everyday services within walkable distances, while the TOD approach reinforced the role of transport infrastructure as a catalyst for compact, mixed-use development. Together, these perspectives formed a comprehensive analytical framework for examining how mobility and land use interact in the construction of more balanced and sustainable urban systems.

Within this context, the radial analysis methodology translated these theoretical principles into operational terms, offering a comparable tool for identifying the presence, absence, and concentration of uses and services around transport nodes. Its application to the selected case studies revealed both opportunities and limitations within the current urban fabric. In Cali, the analysis highlighted areas with relatively high connectivity and functional diversity, alongside persistent challenges related to spatial fragmentation

and uneven service distribution. In Jamundí, the predominantly consolidated residential fabric revealed significant opportunities to orient future development toward more compact, mixed-use patterns supported by public transport infrastructure.

Based on these findings, the recommendations derived from this chapter should be understood as a set of requirements that must be addressed for future interventions to effectively promote metropolitan connectivity, accessibility, and urban well-being. Rather than constituting prescriptive design solutions, these recommendations define the conditions necessary to consolidate a more coherent and balanced system of centralities.

First, transport stations must be conceived not only as mobility infrastructures but as structuring elements of integrative urban centers. This requires the incorporation of a diverse mix of uses and services within their areas of influence, ensuring that stations support everyday activities and function as active nodes within the metropolitan network. Second, the consolidation of mixed-use development and local facilities is a necessary condition to strengthen neighborhood-level self-sufficiency and reduce dependence on motorized transport. Ensuring proximity between housing, services, education, and employment opportunities is essential to improving everyday accessibility and reinforcing walkable urban environments.

Third, metropolitan coordination mechanisms are required to ensure that new interventions contribute to a coherent and balanced polycentric structure. This includes aligning land-use planning, transport infrastructure, and service provision across municipal boundaries, preventing fragmented development and uneven accessibility across the region.

Finally, future project development should complement spatial and functional analyses with qualitative dimensions, such as pedestrian experience, social inclusion, and the quality of public space. Addressing these aspects is necessary to ensure that metropolitan planning not only improves functional efficiency but also contributes to social equity and overall urban well-being.

Together, these conclusions and requirements provide the conceptual and methodological foundation for the design and implementation proposals presented in the following chapters, consolidating an integrated vision of a polycentric, connected city oriented toward sustainable development.

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03

Construction of the Call for Architects From metropolitan diagnosis to project design

- The competition: As an instrument of metropolitan intervention
- The “Tren de Cercanías”: Context, Technology and Key Design Decisions
- From diagnosis to commission: translating evidence into a project
 - Regulatory, heritage, and environmental constraints
 - Design criteria structuring the competition
 - Construction of the architectural program
 - Disciplinary Scope and Expected Impacts

The Competition

As an Instrument of metropolitan intervention

The final component of this thesis consists of the formulation of an international architecture competition whose purpose is to materialize, in a specific design exercise, the reflections developed throughout the document. The thesis has demonstrated that the Cali-Jamundí relationship is not only functional but also structurally dependent: Jamundí operates as a commuter town, concentrating large portions of residential growth while outsourcing a significant portion of its services, facilities, and opportunities to Cali. This dependency reinforces territorial inequalities, overloads intermunicipal mobility systems, and limits the construction of a distinct urban identity.

In this context, the competition is not understood as a formal end in itself, but as a tool for urban policy and the production of disciplinary thought. It is proposed as a mechanism to activate debate, generate proposals, and produce architectural-urban knowledge on how to design contemporary civic infrastructure that contributes to consolidating Jamundí as an active metropolitan node within the Commuter Train system.

The competition is thus constructed as a bridge between the conceptual framework developed, the territorial and functional diagnosis carried out, and the need to offer concrete spatial responses that reduce Jamundí's hyperdependence on Cali.



Figure 32 - Street View - Road 14 to the Cultural House. | Source: Google Earth PRO

The “Tren de Cercanías”:

Context, Technology and Key Design Decisions

Before examining the construction of the competition itself, it is essential to present the officially approved context of the “Tren de Cercanías del Valle” project, as well as the aspects proposed by this thesis.

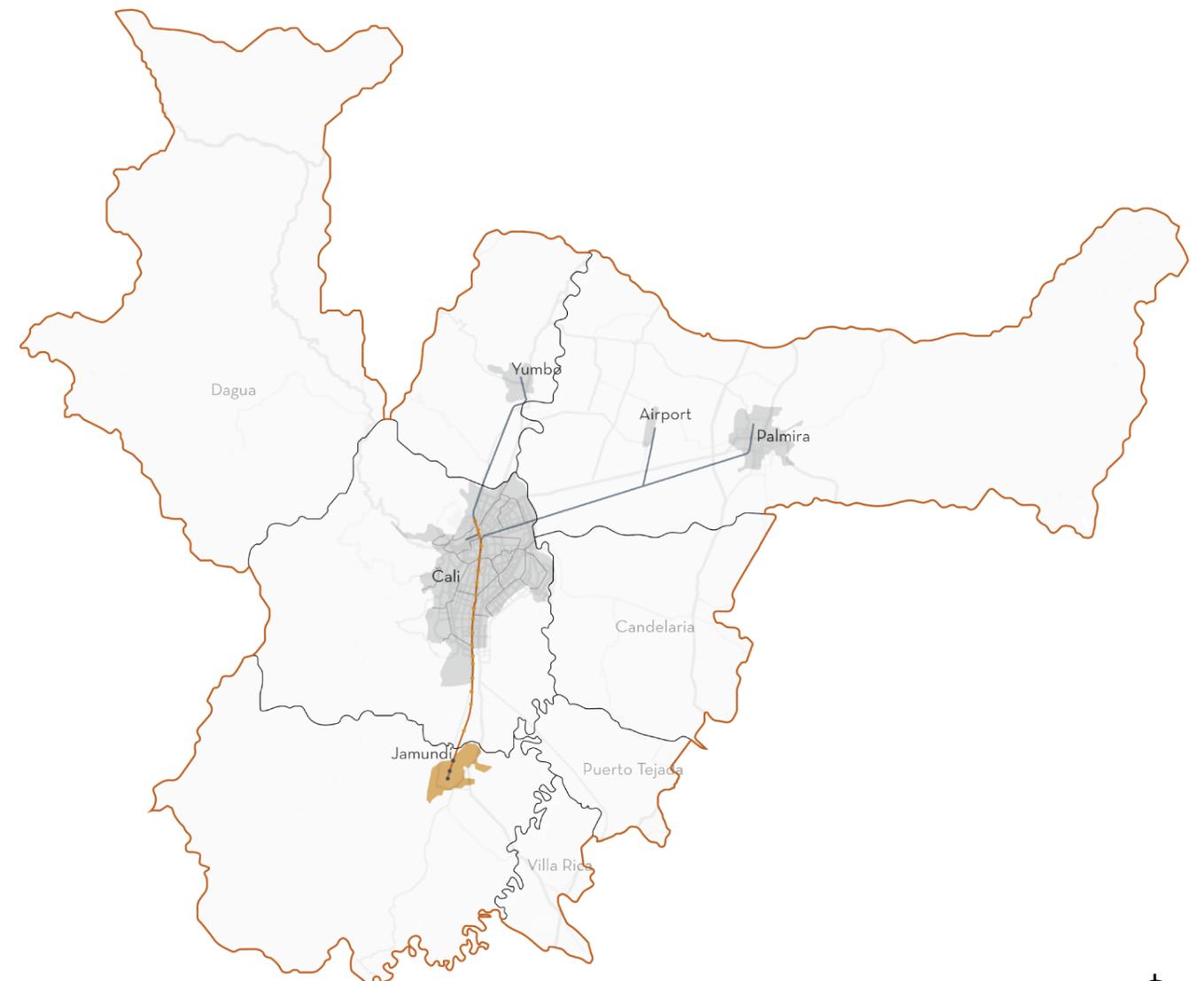


Figure 33 - “Tren de Cercanías” Sections - Metropolitan Scale. | Source: Author's elaboration

The Tren de Cercanías is a metropolitan mobility project aimed at improving daily flows between Cali, Yumbo, Palmira, and Jamundí. Conceived as a light rail system with tram-like

characteristics, it will extend approximately 73 kilometers and include 48 stations, operating through electric traction powered by catenary, with a design speed of up to 110 km/h and a

Construction of the competition
Project Context



Figure 34- Bilbao's Streetcar. | Source: "El tranvía de Bilbao anuncia cambios en su recorrido por la renovación de las vías," Crónica Vasca, July 26, 2022

capacity of nearly 1,000 passengers per train. Figure 34 shows the train from Bilbao, which is mentioned by the project's managing authority as a reference train typology. Within this wider network, the first prioritized implementation phase corresponds to the Cali-Jamundí corridor, 23.6 kilometers in length and containing 21 stations, the last three of which are located within Jamundí's urban area (stations 19, 20, and 21). Station 21 becomes particularly relevant as it functions as the southern terminal of the system and introduces a new point of metropolitan accessibility for the municipality.

The project largely follows the route of the former railway corridor, a condition that represents both an opportunity and a constraint. By law, the State can make use of an 11.5-meter strip on each side of the rail axis—approximately 23 meters in total—to develop the train project. However, the existing urban corridor is currently only about 15 meters wide between sidewalks, meaning that the implementation of the system requires acquiring roughly 8 additional meters, thereby affecting consolidated properties. This situation requires understanding the infrastructure not as an isolated element, but as an integrated urban intervention capable of restructuring the surrounding space.

Within this context, Station 21 becomes the strategic point from which this thesis proposes not merely to receive the train but to structure a broader urban transformation. Although the technical documents propose a specific location (Figure 36) within the railway corridor, the thesis suggests slightly relocating the station so that it aligns directly with the former railway station—now operating as a Cultural House—thereby strengthening the visual and functional relationship between heritage,

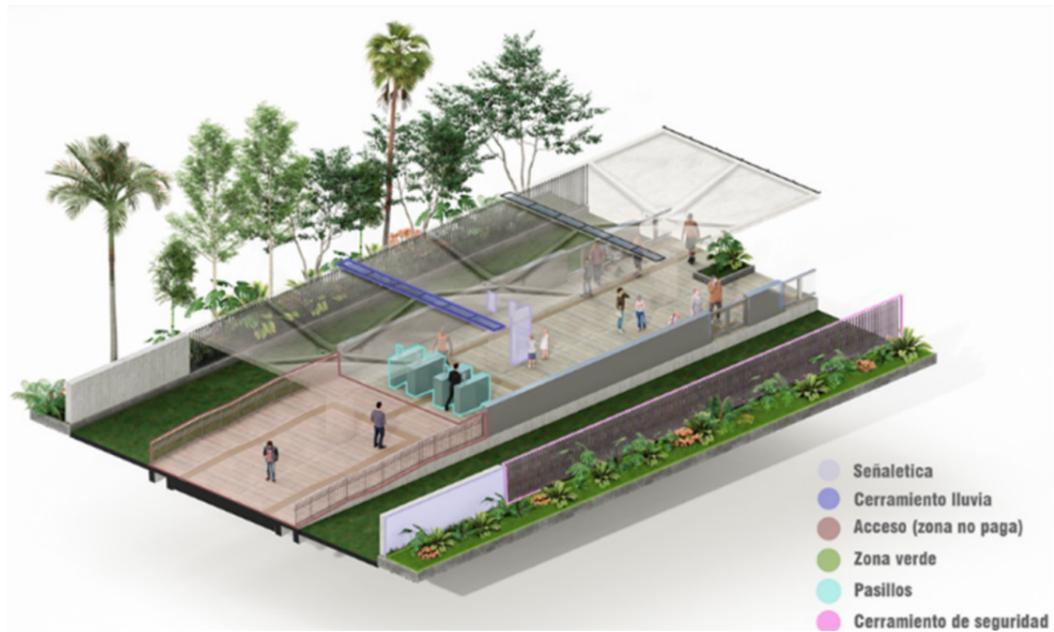


Figure 35 - Station Typology. | Source: Gobernación del Valle del Cauca, "Proyecto Tren de Cercanías Del Valle Del Cauca- TCV."

■ Thesis station proposal
■ "Tren de cercanías" station proposal

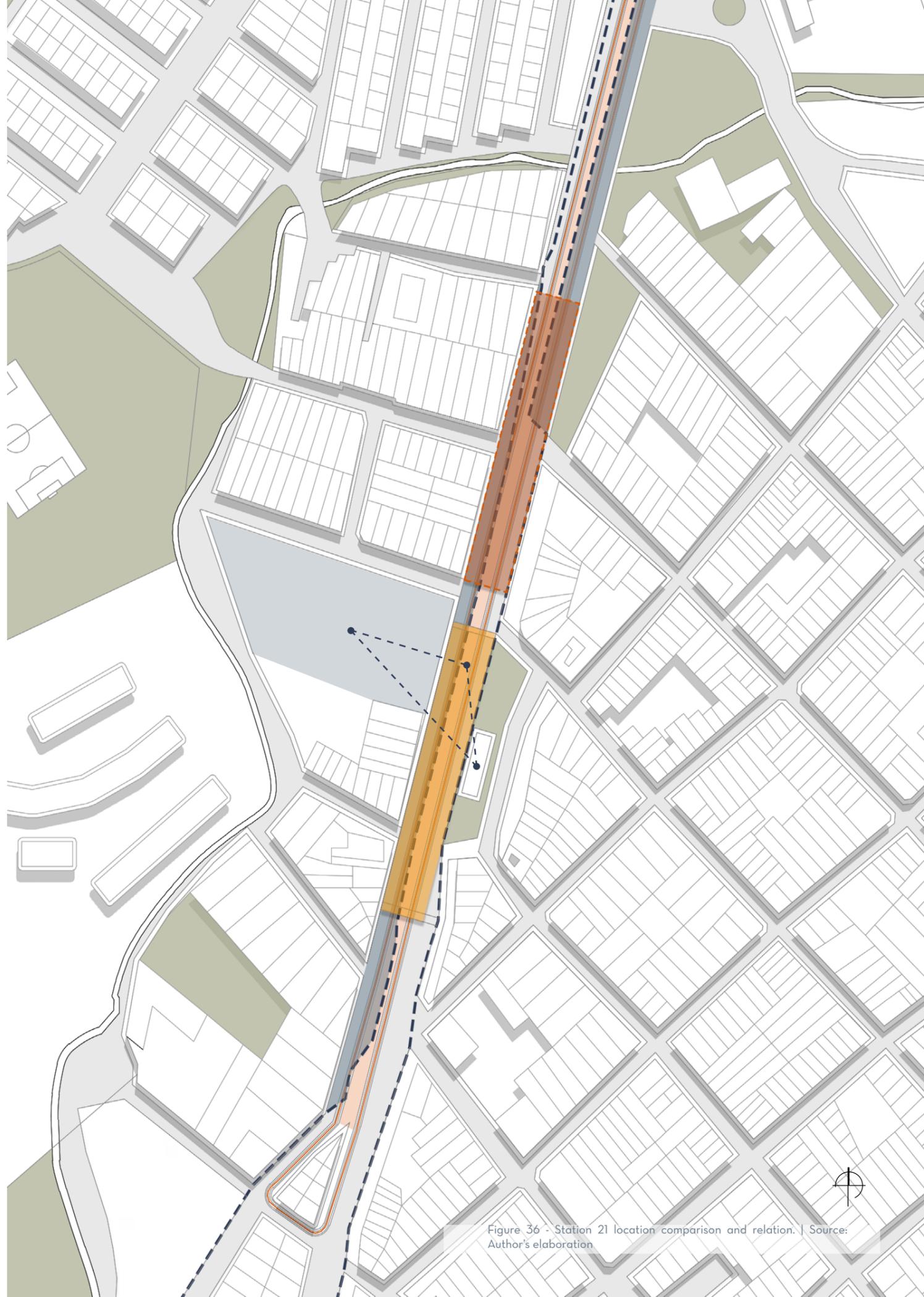


Figure 36 - Station 21 location comparison and relation. | Source: Author's elaboration

Construction of the competition
The Station

mobility, and public space. This adjustment allows the new station to be positioned exactly between the heritage building and the competition site, generating a triangular spatial relationship that supports the consolidation of a metropolitan services loop rather than isolated interventions.

Within this urban framework, the proposed station typology (Figure 35) is conceived as a linear, perimeter-enclosed element measuring approximately 20 meters in width and 150.5 meters in length. The station consists of a lightweight canopy roof structure that facilitates natural ventilation and provides thermal comfort in the region's warm climate. The platform area includes technical rooms, restrooms, and landscaped zones. Lateral safety enclosures and green buffer strips are incorporated, and access to the station is provided only at its ends, resulting in an element that reinforces physical separation between both sides of the corridor, further intensifying the barrier effect already produced by the railway infrastructure.

The second key decision of this thesis directly challenges the enclosed configuration of the station and materializes it in the sectional transformation of the corridor. According to the PBOT, this segment is classified as a V-2 road, conceived primarily as vehicular infrastructure with two traffic lanes and a central divider. This thesis redefines the corridor as a hybrid urban street in which the tram, vehicular traffic, pedestrians, and landscape are deliberately integrated at a single level, with only the station platform slightly elevated to ensure operational and safety requirements. To enable this transformation, the closed-station typology proposed by the project is dismantled: the private isolation strip and metallic enclosure are removed, reducing the overall width of the section and prioritizing spatial permeability. Through this operation, the station no longer functions as a barrier, but instead operates as a civic interface, ensuring the continuity of the street and consolidating a mixed section that is consistent with Jamundí's

urban scale.

Through these decisions, the Tren de Cercanías is no longer understood solely as transport infrastructure but rather as an urban project. Its technical and spatial characteristics directly inform the formulation of the architectural competition and establish a fundamental premise: the objective is not simply to design a station that receives passengers, but to construct an integrated urban environment where mobility, public space, heritage, and new metropolitan services articulate coherently.

-  (PA) Plot Area: 7984m²
-  (PT) Protection Area: 1703m²
-  Street

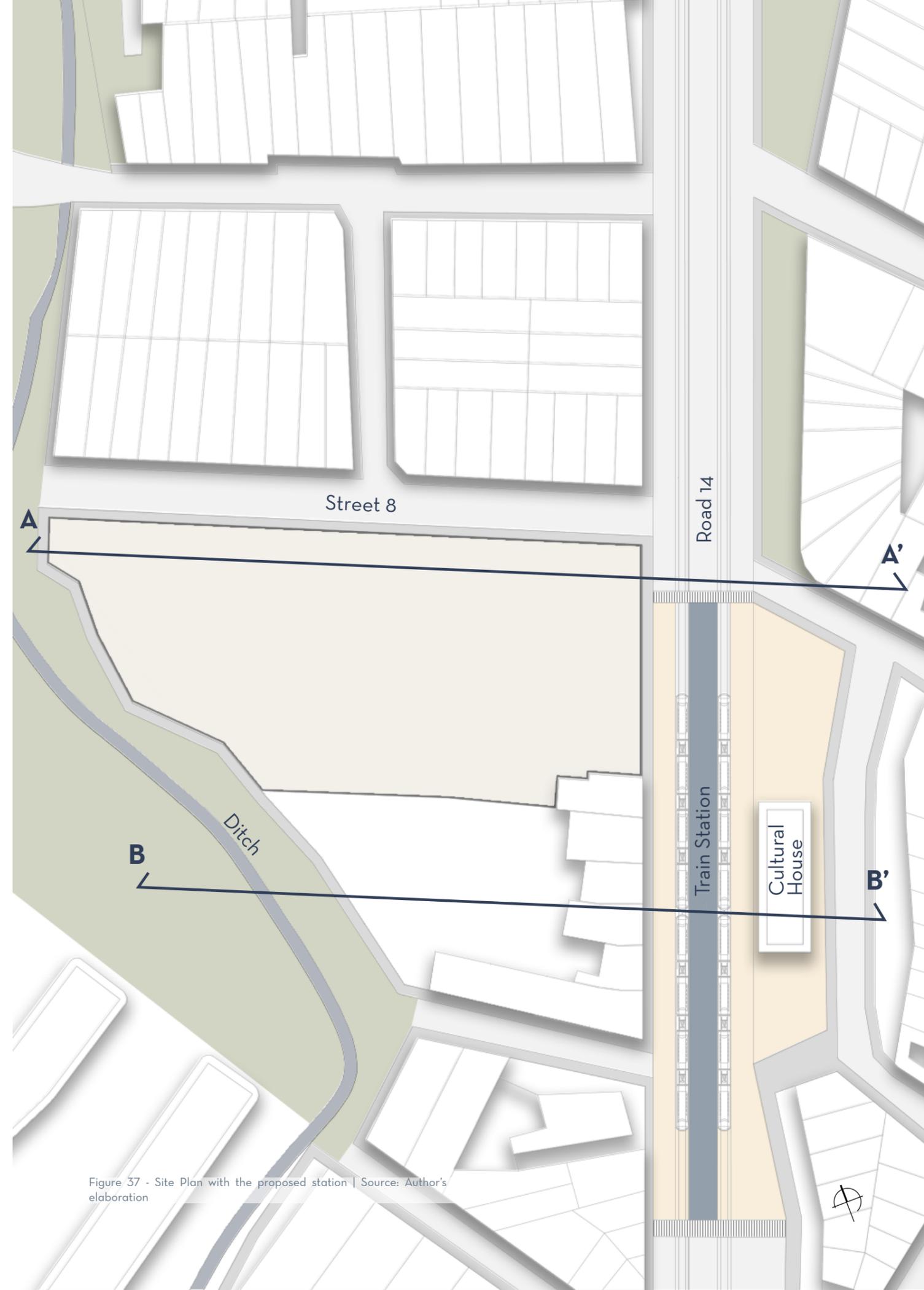
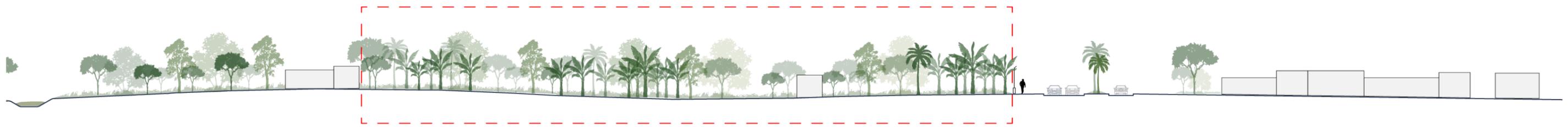
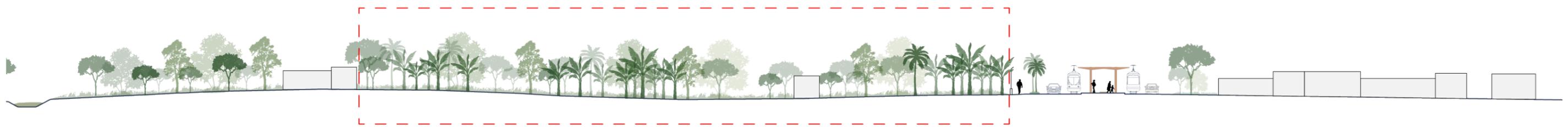


Figure 37 - Site Plan with the proposed station | Source: Author's elaboration



Project Plot

Figure 38 - Actual Section AA'. | Source: Author's elaboration



Project Plot

Figure 39 - Thesis proposed Section AA'. | Source: Author's elaboratio



Figure 40- Actual Section BB'. | Source: Author's elaboration



Figure 41 - Thesis proposed Section BB'. | Source: Author's elaboration



From diagnosis to commission: Translating evidence into a project

The formulation of the competition derives directly from the previous urban analysis, from which three key findings are fundamental to understanding the construction of the design brief. The first was identifying that Jamundí presents structural deficits in intermediate- and metropolitan-scale facilities, such as higher education infrastructure, cultural amenities, administrative services, productive spaces, and flexible work environments. This situation forces residents to commute daily to Cali, reinforcing Jamundí's role as a "dormitory city."

In response to this condition, the competition brief reinterprets the concept of the 15-minute city at the project scale. The transformation of the station from a simple transport node into a small but well-sized hub of services integrated with the everyday needs of the population reflects a shift away from centralized planning models toward a more disaggregated and citizen-oriented distribution of services. Rather than concentrating facilities in distant urban centers, the proposal seeks to bring education, work, cultural, and social programs closer to daily life, strengthening Jamundí's functional autonomy and reducing dependence on long-distance commuting.

The second finding was understanding how the implementation of the Tren de Cercanías redefines the structure of mobility and urban centralities. Station 21, conceived as the southern terminal of the system, is strategically located near the historic city center, the municipal hospital, consolidated residential areas, and the urban expansion front. This positioning transforms the station's immediate surroundings into an opportunity to create a multimodal urban hub that not only receives flows, but also generates activity, services, and permanence.

Finally, the third finding was recognizing that this part of the city belongs to Jamundí's heritage area and forms part of the structuring public space system. This means that, from a regulatory perspective, new projects must be conceived as qualified extensions of this system, fully integrated with the existing public realm. This becomes particularly relevant because the competition site relates simultaneously to the public space of the former railway station and to that of the future commuter rail station. Generating synergy between these three spaces therefore became a fundamental determinant of the project.

Based on this, the competition proposes the design of a multimodal facility that complements both the historic and the new station, integrating:

- educational programs,
- cultural services,
- infrastructure for work and productivity,
- high-quality, climate-responsive public space.

This facility is not conceived as a simple annex, but as a structuring urban element capable of consolidating a new centrality for Jamundí.



Figure 42 - The Old Railway Station. | Source: Author's elaboration

Constraints:

Regulatory, heritage, and environmental

The formulation of the competition acknowledges that every urban intervention operates within specific regulatory and contextual frameworks. The project area is located within Jamundí's heritage zone, which implies a conservation-oriented treatment that prioritizes morphological continuity, controlled scale, and a respectful relationship with historical buildings, particularly the former railway station.

These urban, environmental, and regulatory conditions are not understood as limiting restrictions, but rather as project qualifiers that guide the urban form, the placement of building volumes, the relationship with the natural landscape, and the way in which the new facility must be integrated into the existing public space system.

In this sense, the determining conditions are as follows:

- **Site Coverage and Floor Area Ratio:** these indices are not strictly fixed by regulation, but are instead defined through analysis of the immediate urban context. Although the surroundings present high levels of site occupation, the project proposes a 50% site coverage in order to improve environmental conditions, favor cross-ventilation, ensure functional courtyards, and promote high-quality open spaces. In coherence with the predominant building heights of the area and the conservation treatment of the heritage zone, a floor area ratio of approximately 0.70 is proposed, allowing a balanced relationship between built volume and open space.
- **Setbacks:** this sector does not require lateral or frontal setbacks; on the contrary, regulations encourage buildings to be constructed directly along the sidewalk, reinforcing a continuous street profile and the creation of active urban facades.

- **Public Space Dedication:** although there is no formal obligation to transfer specific public space areas to the municipality, it is essential that the project incorporate collective spaces that meaningfully interact with their context, such as plazas, courtyards, corridors, or gathering areas.
- **Building Placement and Heights:** regulations also establish clear criteria indicating that new constructions must align with existing buildings in both facade and height. Setbacks and additional height are only permitted within the interior of the plot, ensuring continuity along the street edge while allowing spatial flexibility internally.
- **Environmental Protection Strip:** the site is linked to a protected environmental zone associated with the adjacent drainage channel, establishing a mandatory 30-meter buffer in which construction is not permitted and which must acquire ecological and landscape value within the project.
- **Accessibility and Universal Design:** In accordance with the Colombian Seismic Resistant Code NSR-10, Title J (Accessibility), all proposals must ensure universal access to buildings, public space, and transport interfaces. Circulation systems, entrances, vertical and horizontal connections, and sanitary facilities must be designed to guarantee safe, autonomous, and continuous use by people with reduced mobility, sensory disabilities, and diverse physical conditions. Accessibility is to be understood not as an isolated technical requirement, but as a structuring condition of the project, particularly relevant in a multimodal node that integrates public transport, collective facilities, and public space.

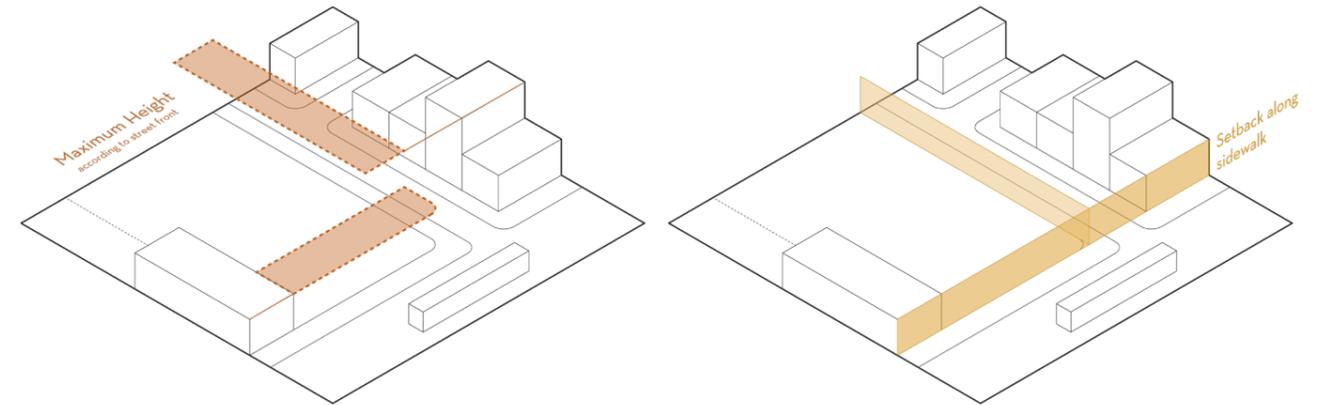


Figure 43 - Maximum Height and Setback diagram. | Source: Author's Elaboration

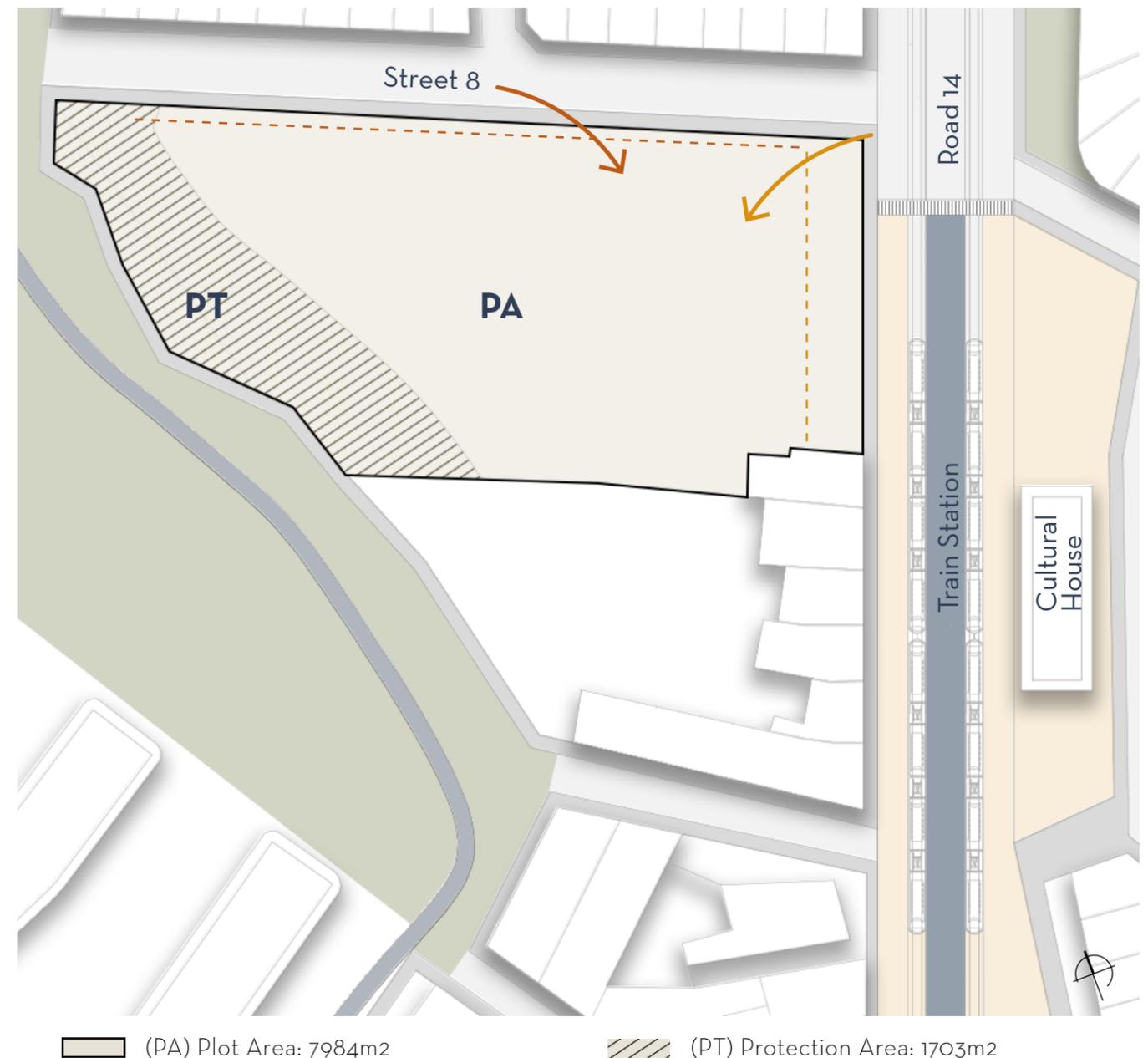


Figure 44 - Plot areas. | Source: Author's Elaboration

Design Criteria: Structuring the competition

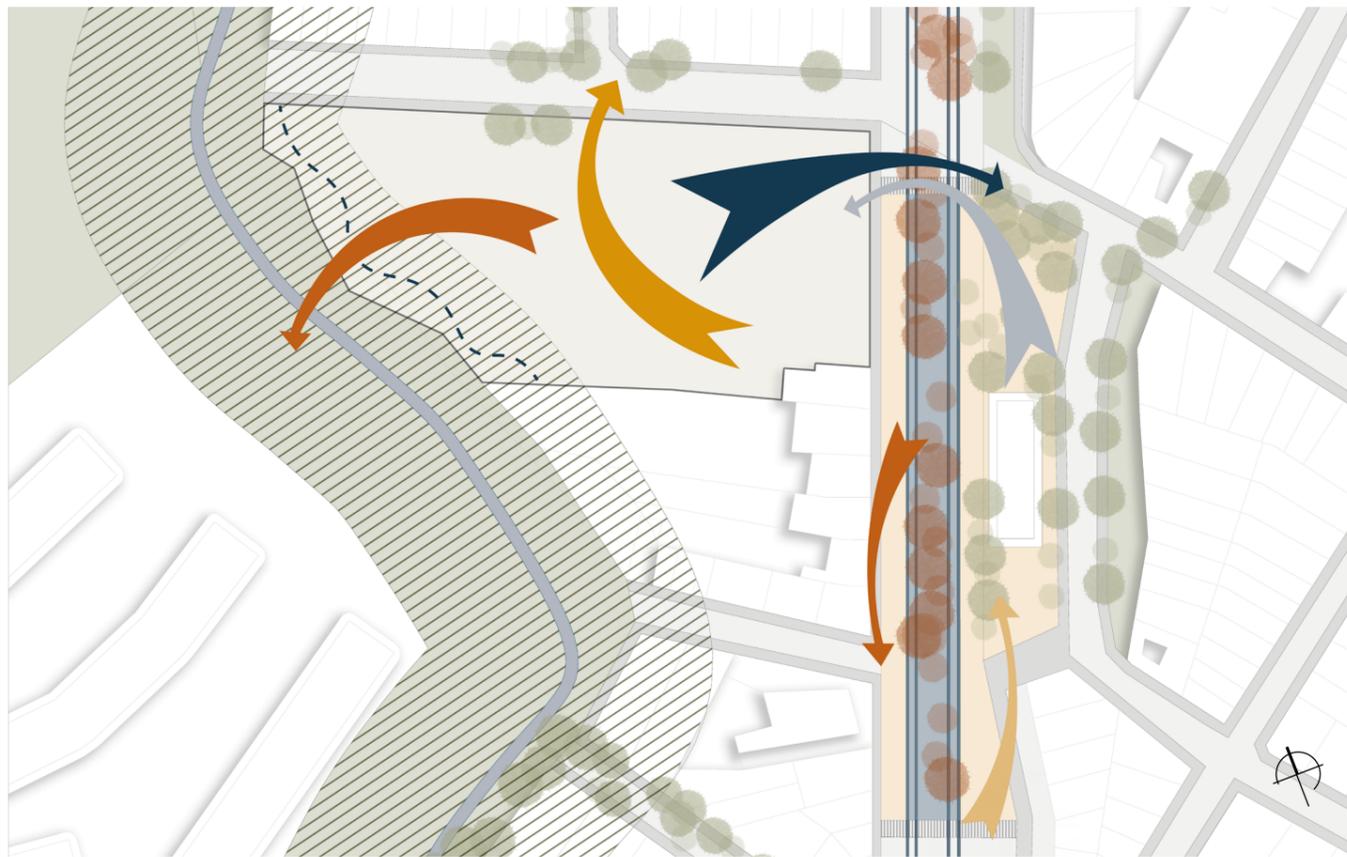
Recognizing all regulatory and contextual constraints, the competition brief is structured around urban, environmental, social, and architectural criteria that stem from the previous analysis and from the metropolitan logic proposed by this thesis. The design criteria for participants and their specific requirements are described as follows:

Real Multimodal Integration:

The project shall not merely coexist with the new and historic stations, but must be articulated spatially with them, enabling clear flows, universal accessibility, and continuous pedestrian connectivity.

Specific Requirements:

- Ground-floor permeability: the facility must allow pedestrian connections, visual relationships, and constant activation of public space.
- The building shall be crossed in multiple directions: from street to street, from the facility to the station, and from the facility toward the rear environmental protection area.
- Main pedestrian entrance on Carrera 14.
- Vehicular entrance and loading zone on Calle 8.



Each arrow indicate the different connections that the project must have with the immediate context

Figure 45 - Plot influence flows. | Source: Author's Elaboration

Living Heritage:

The former railway station is not understood as a scenic backdrop, but as a central actor within the system of places.

Specific Requirements:

- Safe pedestrian paths must connect the new facility with the historic station.
- The building shall generate or reinforce visual axes toward the heritage structure.
- The architectural proposal must respect the historic scale of the sector.

Climate as a Designer:

Thermal comfort is fundamental under the tropical condition of the site; therefore, the building and the plot shall be designed to maximize cross-ventilation, shading, low-temperature surfaces, and the provision of vegetation.

Specific Requirements:

- Building orientation shall prioritize protection from east-west solar radiation, placing façades with smaller areas in these directions.
- The implantation shall maximize north-south ventilation corridors, concentrating most openings in those orientations.
- The project must incorporate rainwater retention, infiltration, and controlled conduction strategies (for example: infiltration trenches, rain gardens, and draining surfaces), avoiding concentrated discharges toward the drainage channel.
- Tree removal or relocation may vary according to the design; however, any intervention must be compensated under a minimum 2:1 criterion, privileging species suitable to the local context.
- A list of recommended municipal species shall be annexed (Appendice B), recognizing existing palms as part of the vegetal character of the place.

- Trees located outside the plot and affected by corridor works shall be obligatorily replaced under a 1:1 criterion with an additional 15% contingency margin.

Improving the Environmental Protection Area:

More than a limit, this condition becomes an opportunity. The competition requires the integration of this edge as a naturalized park, ecological corridor, and/or extension of public space, strengthening sustainability, thermal tcomfort, and resilience.

Specific Requirements:

- The area must include an ecological path that allows it to be experienced as natural landscape.
- The ecological path implemented on the opposite side of the channel by the nearby urban development is taken as a reference.
- The proposal shall relate this environmental strip with the facility's programs through visual connections, courtyards, and gathering spaces.

Urban Safety:

Visible, active, illuminated, and appropriable spaces linking design with the prevention of fear in the public realm.

Specific Requirements:

- Public space shall always be proposed in relation to active façades.
- Lighting elements must be placed below the tree canopy.
- Visual transparency and permanent uses on the ground floor are mandatory.

Local Sustainable Construction Technique:

The use of regional materials and sustainable

constructive practices is encouraged, favoring identity, local economy, and low environmental footprint.

Specific Requirements:

- Implementation of passive bioclimatic strategies such as perforated walls, lattices, patios, ventilated corridors, and open ground floors in free plan.
- Deep eaves, pergolas, and east-west oriented sunshades.
- Cold roofs through sandwich-type thermoacoustic panels, zenithal ventilation, natural insulation, and high-reflectance surfaces (albedo).
- Optimized use of concrete only where strictly necessary.

- Controlled use of fully glazed façades and heavy metallic enclosures.

Suggestions:

- Use of local materials with low environmental footprint such as guadua and certified timber in some parts of the projects, for example in portico structures, façades, pedestrian bridges, and light roofing systems.
- Use of brick and compressed earth blocks (BTC/CEB) in walls benefiting from its nearby production.

The competition's architectural program emerges from a simultaneous reading of local demands, metropolitan needs, and the site's constraints and opportunities. To begin with, the land-use and activity analysis showed that the area around the future station already presents a diverse mix of everyday functions. Consolidated residential neighborhoods, local commerce, elementary schools, and the municipal hospital shape a territory of intense daily use, although with limited services at a metropolitan scale. The former railway station, currently used as a small library and cultural house, is part of this network of places and will be integrated into the sector's renewal process. Understanding this existing condition was key to avoiding a self-referential infrastructure project and, instead, proposing a facility that complements what is already there, reinforcing the civic scale without weakening proximity-based uses.

The functional diagram illustrates how the program was built through successive layers of reasoning. At the center is the metropolitan station node, defined by the connectivity and daily flows generated by the suburban train project. This infrastructural core is the main starting point, since the building must respond to passengers, intermodal transfers, and the associated public space. From this center, a second layer is organized as a shared support system that makes the facility operational, ensuring construction and economic efficiency and allowing functions with different schedules to coexist without duplicating services. This system accounts for 876 m², of which 263 m² are allocated to circulation, and includes the following specific spaces.

- Lobby + information
- Cafeteria + seating
- Public restrooms
- General administration
- Security and control
- General storage
- Technical rooms
- Waste and recycling
- Janitor's room

Moving forward, the third layer incorporates the main architectural program, defined in response to the metropolitan deficits identified in Jamundí. Based on this, it is organized into three main functional systems.

Education and higher learning

Planned as 27% of the total project area, equivalent to 1,200 m², with an estimated capacity of approximately 250 users. This function is conceived as a flexible learning hub supporting higher education, tutoring, and community-based training, designed to reduce educational commuting and provide after-school study infrastructure. Within this package, 30% of the area, 360 m², is reserved for circulation.

Specifically, it must include at least the following spaces

- Flexible classrooms: Classrooms for traditional lessons that can be configured in different ways through panels and or furniture.
- Seminar room: A more participatory, presentation-based room that can also host activities such as focus groups.
- Multimedia and computer room: A room with access to computers and technological resources.
- Group study rooms: Small reservable rooms for group work, with space for projection and writable surfaces.
- Learning commons: Zones within a shared space with furniture or workstations for individual or group work, not enclosed within a classroom.
- Makerspace: A larger workshop-type space with tables for light fabrication and or prototyping for creative industries.
- Teachers' room: A reserved space for teachers' desks, lockers, a rest area, and related needs
- Storage: A storage space for the education wing.

Construction of the architectural program:
Uses and general areas

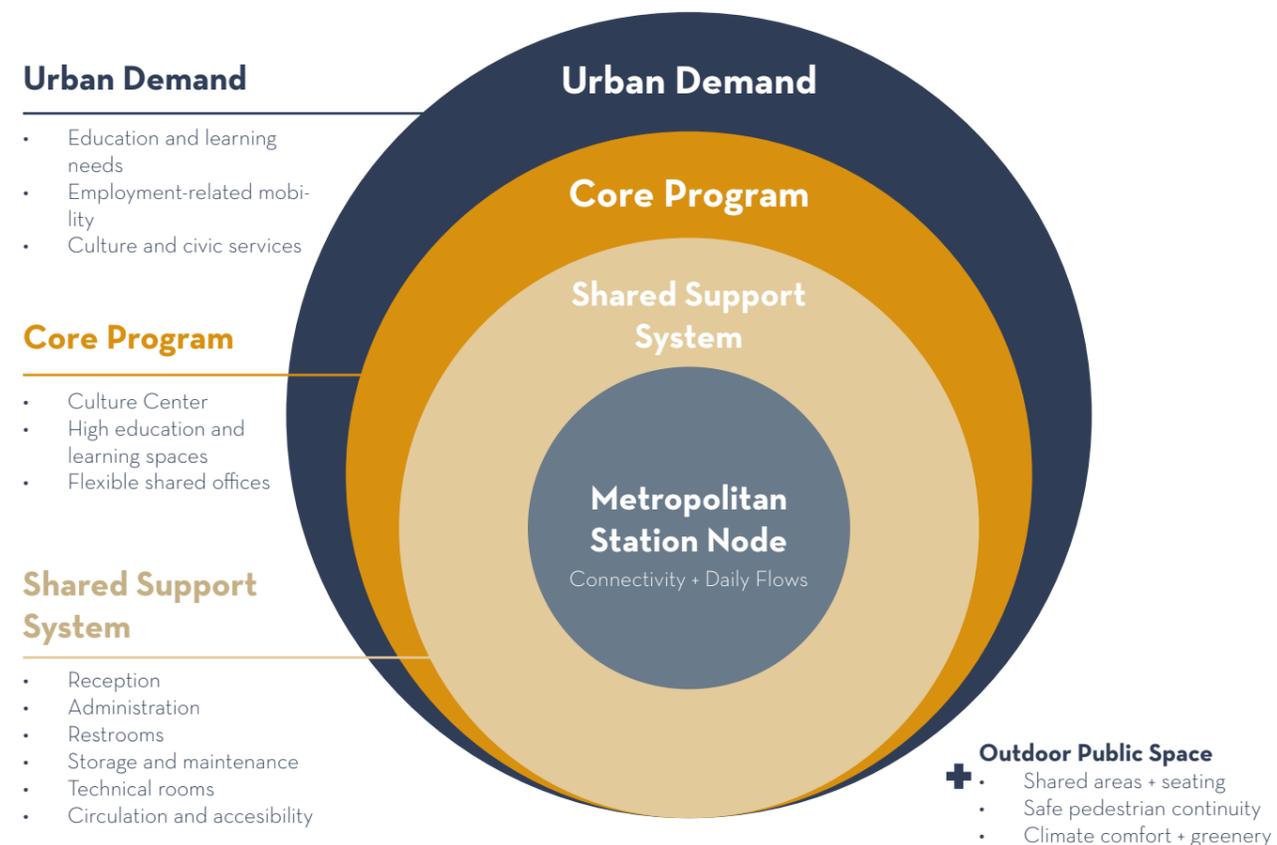


Figure 46 - Functional Diagram. | Source: Author's Elaboration

As special requirements, these spaces must provide

- High adaptability through movable partitions and reconfigurable layouts
- Natural daylight with proper glare control, for example through shaded edges
- Effective cross ventilation in all spaces
- Acoustic control between classrooms and common areas
- Clear separation between quiet study and active making
- Robust finishes for easy maintenance

Cultural and citizenship center

Planned as 30% of the total area, approximately 1,320 m², with an estimated capacity of about 200 users. It is conceived as a civic interior that extends the existing cultural role of the historic railway station, offering reading, learning support, and community programming, and linking it to the new station as a daily public destination. Within this package, 30% of the area, 396 m², is reserved for circulation.

Specifically, it must include at least the following spaces

- Multipurpose auditorium: A space designed to host multiple event types and configurations, not limited to front-facing conferences or presentations.
- Rehearsal room: A room for practicing events that will take place in the auditorium
- Exhibition rooms: Rooms for rotating exhibitions or fairs where residents actively participate.
- Memory archive: A permanent exhibition space focused, for example, on Afro and Indigenous history and or the history of Jamundí.
- Local knowledge workshops: Rooms to teach activities such as music, dance, and local crafts, including guadua work, ceramics, or Pacific cooking.
- Foyer and reception: A space designed as the main threshold into the cultural area.

- Cultural coordination: Administrative offices specifically for the cultural center.
- Storage and mounting area: Storage for cultural equipment and exhibition elements.
- Basic backstage area

As special requirements, these spaces must provide

- Define clear gradients from active to focused to quiet uses and prevent acoustic spillover between common areas and quieter rooms
- Provide long-stay comfort with glare-controlled daylight, stable thermal conditions, and a calm visual environment
- Maintain a strong relationship to public space through elements such as a front plaza and shaded outdoor areas

Work and productivity

Planned as 23% of the total area, approximately 1,000 m², with an estimated capacity of about 150 users. It is conceived as a work infrastructure for commuters and visiting teams, with short-term offices, meeting rooms, and support spaces that allow companies to operate locally without forcing daily travel. Within this package, 30% of the area, 300 m², is reserved for circulation.

Specifically, it must include at least the following spaces

- Co-working area: A zone with different furniture configurations for individual work, group work, shared tables, and cubicles, among others.
- Small offices: Reservable spaces for private work.
- Meeting rooms: Reservable rooms for meetings of 8 to 10 people.
- Training rooms: Rooms for larger sessions, closer to a lesson format, often set up around a round-table layout with projection support.
- Reception and control

- Printing area
- Lockers
- Lounge and breakout area: A rest and informal seating zone.
- Storage: A storage space for the productivity wing.

As special requirements, these spaces must provide

- A mix of privacy levels from open to semi-private to enclosed
- Strong acoustics for speech privacy and a reliable Wi-Fi and IT backbone
- Controlled access for day and night use, with visibility and safety without feeling overly corporate
- Comfort through shading, air movement, and ergonomic lighting for long stays

These uses are conceived as complementary. Learning spaces operate on schedules different from the flexible and shared offices, while

the cultural center provides civic continuity throughout the day and extends the legacy of the historic station.

Finally, an outdoor layer is added as transversal public space. Shaded plazas, pedestrian continuity, climatic comfort, and structured vegetation shape the relationship between the building, the heritage landmark, and the environmental strip along the back edge, reinforcing safety and supporting active evening use.

Through this layered structure, the node is conceived as a metropolitan place capable of hosting regional and everyday functions at the same time. The reasoning shows that the program was not defined by form first, but by a territorial logic that links connectivity, shared support, and strategic uses. This approach invites the facility to be understood as an integrated environment rather than an isolated building, with the potential to reduce Jamundí's daily dependence on Cali and strengthen its civic identity.

Use	Area (m2)	% Per use	Users approx
Education and Learning	1.200	27%	170
Work and productivity	1.000	23%	120
Cultural and civic center	1.320	30%	160
Shared/Support/ Technical	876	20%	-
Total	4.396	100%	450

The areas indicated in this architectural program are referential in nature and serve as a guideline for the development of the project. Participants may propose adjustments, reinterpretations, or include additional uses they consider relevant, provided these are properly justified and do not exceed the maximum permitted total buildable area.

Figure 47 - Program Overview. | Source: Author's Elaboration

Disciplinary Scope and Expected Impacts: Within competition

The competition brief defines not only what participants are required to design, but also the debate it aims to trigger. Rather than seeking a spectacular architectural object, the competition invites reflection on: how to design metropolitan facilities in intermediate cities; how to foster centrality without relying on the major city; how to transform transport infrastructure into an urban opportunity; and how to produce contemporary architecture grounded in respect for heritage.

The competition establishes clear parameters while leaving formal and spatial exploration open, recognizing that the value of the exercise lies in the diversity of possible approaches. Finally, the organization of the competition pursues three levels of impact.

- At the urban and territorial level, it seeks to strengthen Jamundí as an active node within the metropolitan system, reducing functional dependence on Cali and reinforcing a regional polycentric logic.
- At the social level, it proposes to create spaces for meeting, education, work, and culture that improve quality of life and promote community cohesion.
- At the disciplinary level, it aims to contribute to the discussion on the role of architecture in relation to contemporary mobility infrastructures in Latin America.

In sum, the competition operates as the thesis' practical conclusion: it translates theoretical reflection, territorial research, and metropolitan analysis into a concrete proposal capable of intervening in urban reality—not only as an architectural project, but as a strategic city-building action.

Figure 48 - Contest's Plot. | Source: Author's elaboration



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04

Application: A proposal for a Multimodal Urban Hub in Jamundí

Volumetric articulation in response to competition constraints
Public Space, Multimodal Integration, and Living Heritage
Programmatic distribution and functional organization
Environmental Design Guidelines and Climatic Response
Conclusions exploratory architectural proposal as a check of the
call guidelines

This chapter presents the exploratory architectural proposal developed as part of the design-based research process. Rather than constituting a finalized or prescriptive project, the proposal functions as a schematic application of the architectural competition framework previously defined, with the aim of testing its coherence, feasibility, and spatial implications. Responding to the competition criteria, the chapter demonstrates how the analytical findings, normative regulations and other constraints employed for the construction of the call guidelines can be translated into an operative spatial structure. The exploratory exercise presented in this chapter thus serves as a verification device, allowing the research to evaluate the capacity of the competition brief to generate integrated architectural responses to metropolitan-scale challenges, while explicitly acknowledging the provisional and exploratory nature of the design exercise.

Volumetric articulation

In response to competition constraints

The volumetric articulation of the exploratory architectural proposal is defined through a clear distinction between mandatory conditions established by the competition brief and project-specific design decisions developed by the authors. The site and its basic parameters of occupation, alignment, and access are predefined by the call and therefore operate as transversal constraints shared by all potential participants, rather than as strategic choices of the proposal.

At the urban scale, the proposal directly responds to these mandatory constraints by complying with the permitted site coverage, reconstructing a continuous street profile along both Street 8 and Road 14, and aligning building heights with the immediate context. Perimeter volumes respect the established building lines in height, responding to adjacent buildings of one and two stories respectively, as required by the brief to ensure volumetric continuity and avoid abrupt contrasts along the street edges.

Within this regulated framework, the competition allows greater flexibility inside the plot, particularly with respect to volumetric articulation and height. Making use of this condition, the proposal introduces a project-specific formal strategy based on an L-shaped configuration. A principal L-shaped volume is positioned at the corner of the site to respond to

its geometry and urban intersection condition, while two additional, smaller L-shaped volumes are arranged within the interior of the plot. The decision to structure the project around this configuration, as well as the introduction of internal courtyards, emerges from a deliberate design intention rather than from explicit competition requirements.

While the increased height of the interior volumes also results from a design decision, it remains consistent with the competition constraints, which explicitly allow greater vertical development away from the perimeter. In this sense, the proposal demonstrates how mandatory conditions—such as site occupation, street profile reconstruction, and perimeter height alignment—can operate as a generative framework within which architectural form, spatial organization, and environmental performance are developed.

Constraints Met:

- Site Coverage
- Setbacks
- Building placement and Heights
- Environmental Protection strip

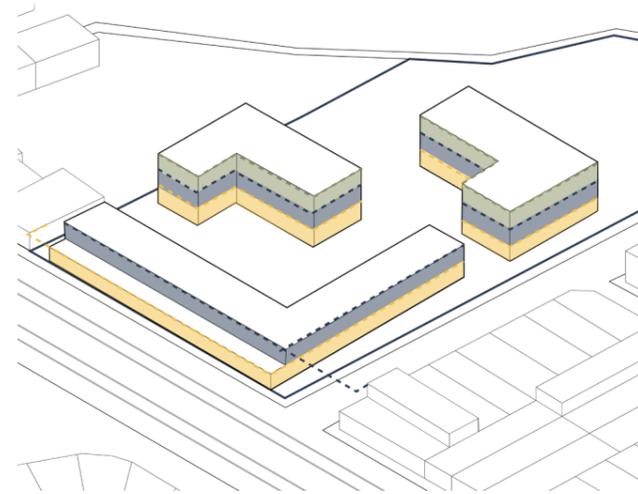


Figure 49 - Reconfiguration of Street Profile and Heights Diagram. | Source: Author's elaboration

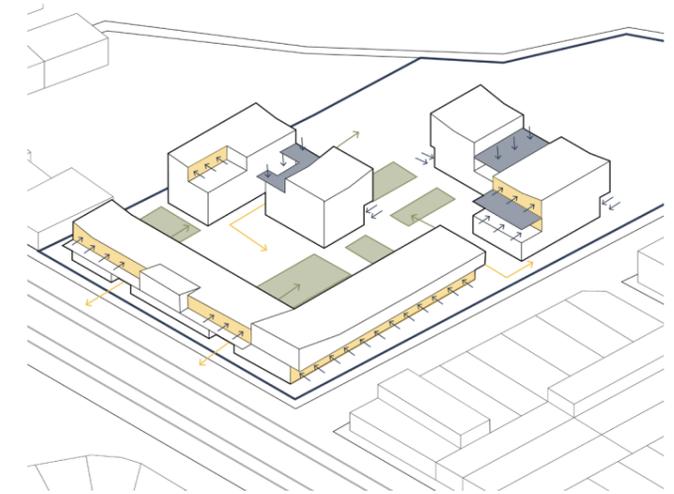


Figure 50 - Volume Abstraction. | Source: Author's elaboration

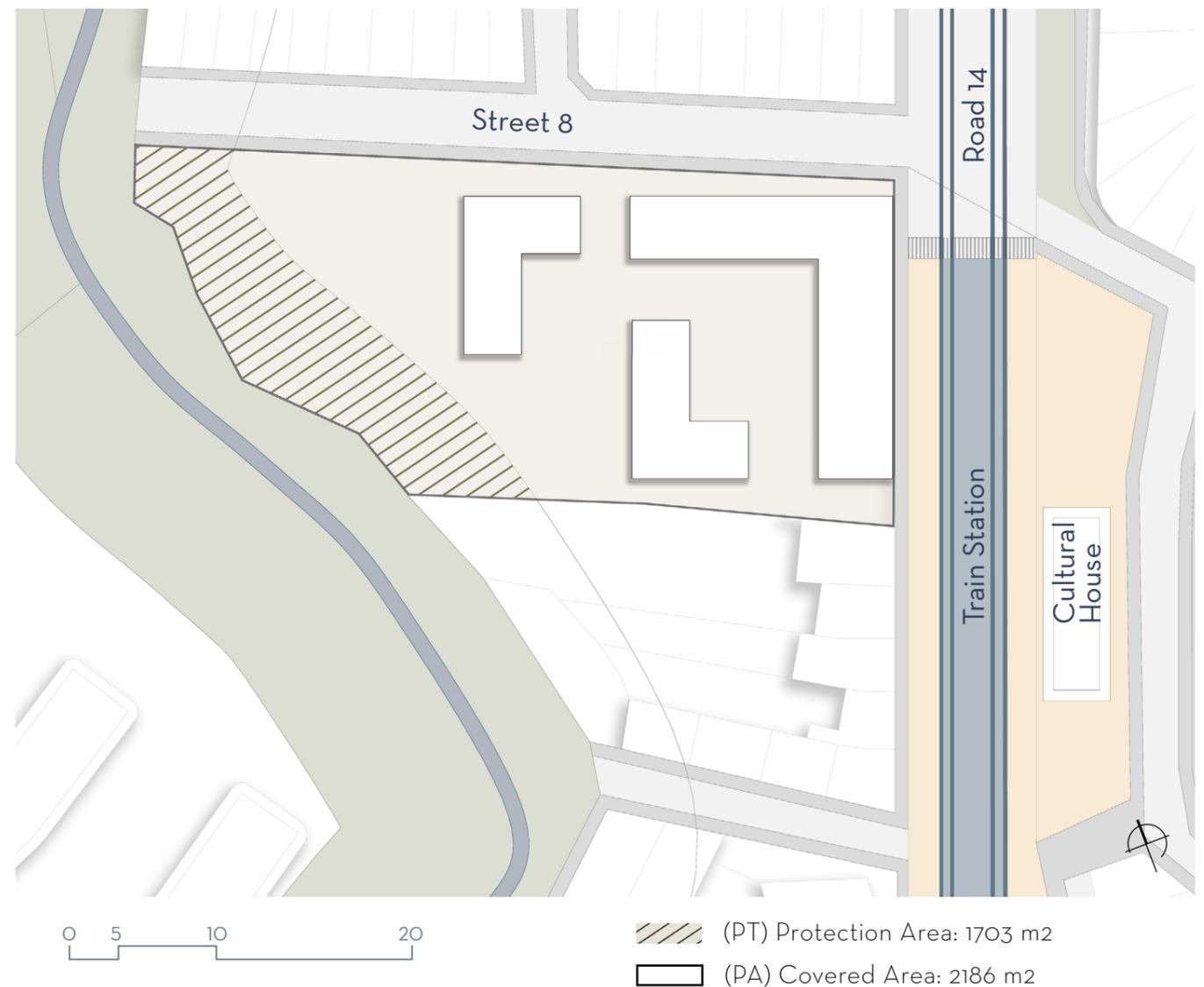


Figure 51 - Plot with proposed volumes. | Source: Author's elaboration



 **ÁGORA**
CENTRO CÍVICO MULTIMODAL

Public space

Multimodal Integration, and Living Heritage

The configuration of public space within the project responds, first, to mandatory regulatory conditions established in the competition brief. Although there is no formal requirement to transfer public space to the municipality, the brief explicitly states that any collective space generated within the project must meaningfully interact with the surrounding urban fabric. In response to this constraint, the proposal organizes its ground floor as an open and accessible public plane, ensuring continuity between the site, adjacent streets, and the railway corridor, and allowing public life to extend into and through the project.

In parallel, the competition defined specific design requirements related to multimodal integration. These included ground-floor permeability, the possibility of crossing the site from multiple directions, and the location of the main entrance along the street facing the Tren de Cercanías. The project directly complies with these requirements by enabling multiple pedestrian connections from all surrounding streets, structuring continuous circulation paths across the site, and placing the primary entrance and general reception along the railway-facing frontage. As a result, the public ground floor operates as a connective interface between the new station, the surrounding neighborhoods, and the environmental edge.

A third set of requirements, articulated under the concept of Living Heritage, guided the project's relationship with the historic railway station. The brief required the incorporation of safe pedestrian crossings, reinforced visual axes toward the heritage structure, and a careful response to the small-scale character of the surrounding context. These conditions are addressed through clearly defined and protected pedestrian routes linking the new facility with both the historic and new stations,

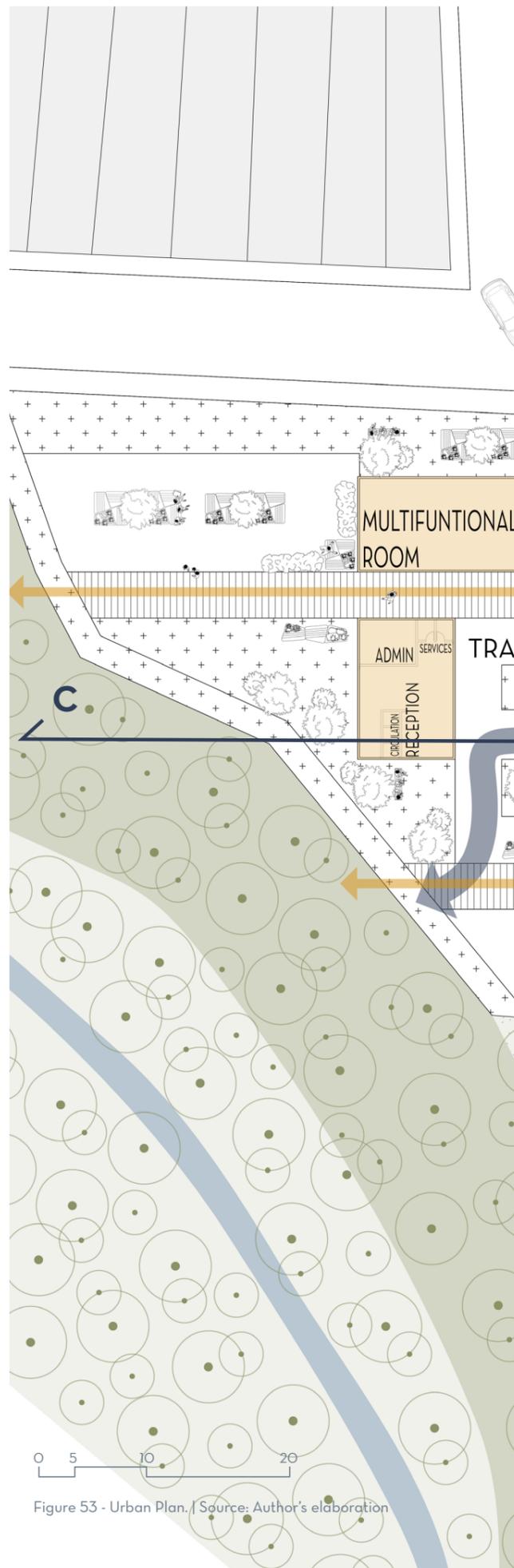
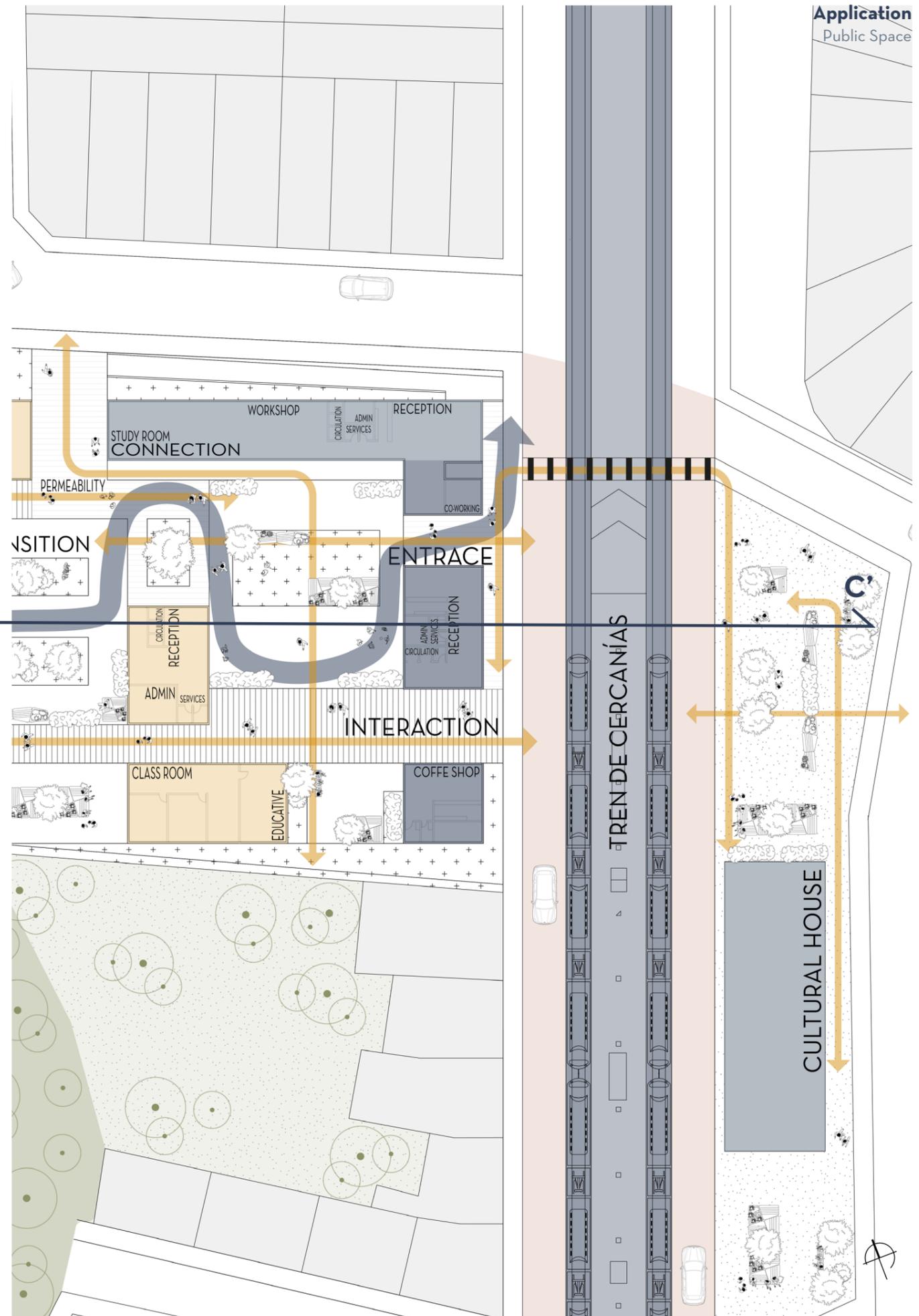


Figure 53 - Urban Plan. | Source: Author's elaboration



Application
Public Space

the orientation of built volumes to frame visual connections, and the inclusion of an elevated terrace oriented toward the former station. Additionally, the building facing the historic station maintains a deliberately low height, ensuring continuity with the existing scale and avoiding visual competition with the heritage structure.

Within this framework of constraints and requirements, the project introduces a design-driven decision regarding the formal articulation of public space. While permeability and interaction are mandated, the specific rectangular configuration of the main public space emerges from the project's volumetric strategy rather than from the brief itself. This formalization results from the arrangement of the L-shaped volumes and provides spatial clarity, legibility, and flexibility, transforming regulatory and programmatic requirements into a clearly structured civic space that supports movement, encounter, and everyday use.

Requirements Met:

- Real Multimodal Integration
- Public Space Dedication
- Living Heritage
- Environmental Protection strip
- Urban Safety



Figure 55 - Urban Transversal Section CC'. | Source: Author's elaboration

Programmatic distribution and functional organization

The programmatic framework of the project is primarily defined by the competition brief, which establishes the required uses—education, culture, and work/productivity—as well as the minimum areas, quantities, and types of spaces to be included. These requirements are presented through a reference program table that functions as a mandatory baseline for all proposals, ensuring comparability between submissions and a consistent response to the objectives of the call.

Within this framework, participants are granted a limited degree of flexibility regarding the spatial distribution and internal organization of the prescribed program. While the brief defines what spaces must be included and their minimum dimensional requirements, it allows each proposal to determine how these spaces are arranged, connected, and

hierarchically structured within the building system, provided that the overall construction indices are respected.

In response to these conditions, the proposal incorporates all required programmatic components in accordance with the brief, ensuring full compliance with the specified areas and functional relationships. Rather than altering or expanding the programmatic scope, the project focuses on translating the given requirements into a coherent and legible functional system, in which educational, cultural, and productive uses are clearly differentiated yet spatially interconnected. The design agency of the proposal is exercised primarily through the articulation and sequencing of programs. Educational spaces, illustrated in yellow, are grouped to support controlled learning environments while

remaining connected to shared circulation and common areas; cultural programs, shown in light blue, are positioned in direct relation to public space and pedestrian flows to allow independent use; and work and productivity spaces, evidenced in dark blue, are organized to balance openness with the need for concentration and controlled access.

Once all mandatory spaces were accommodated, the proposal identified a residual margin of buildable area within the permitted construction index. This remaining capacity was intentionally redistributed in the form of complementary spaces, including areas for rest, contemplation, and informal gathering, as well as expanded learning commons and study areas. These spaces were not required by the brief, but were introduced to enhance everyday use, comfort, and flexibility without exceeding regulatory limits.

Overall, the programmatic distribution reflects a balance between strict adherence to competition requirements and selective design-driven adjustments. By prioritizing functional clarity, operational efficiency, and the integration of supportive spaces, the proposal demonstrates how a largely predefined program can be spatially interpreted and enriched, resulting in an adaptable architectural system capable of supporting diverse activities within a metropolitan multimodal hub.

Requirements Met:

- Covered Area
- Built Area
- Program

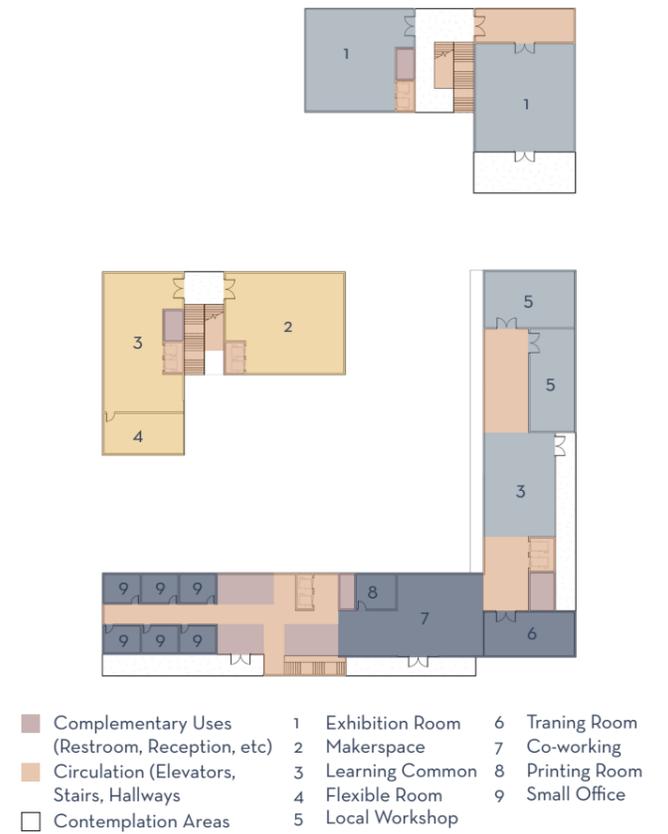


Figure 57 - Second Floor Plan Uses. | Source: Author's elaboration



Figure 58 - Third Floor Plan Uses. | Source: Author's elaboration

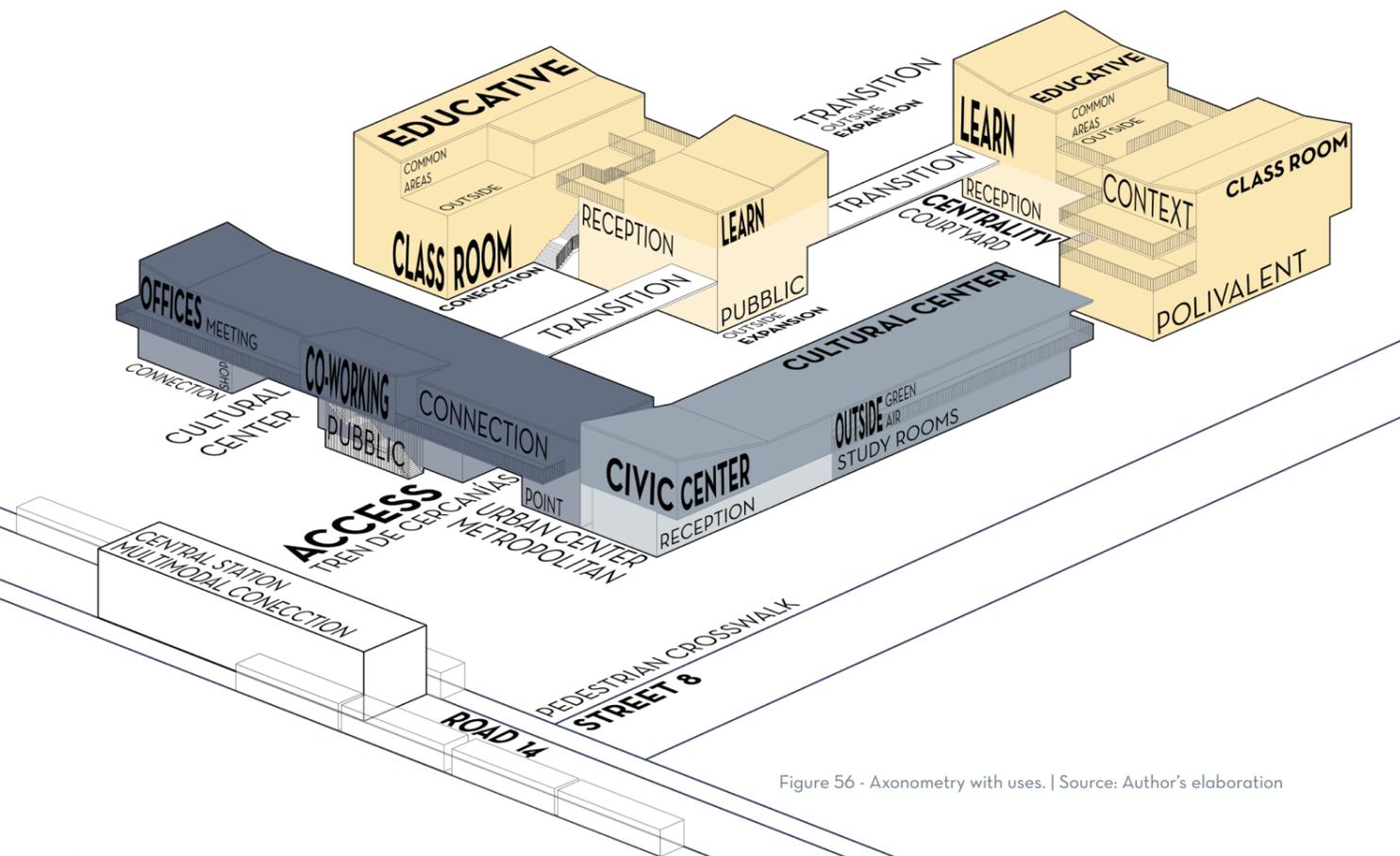


Figure 56 - Axonometry with uses. | Source: Author's elaboration



Figure 59 - Flexible Room Image. | Source: Author's elaboration with Revit + Krea

Use	Space	#	Users	m2 per User	Total Area
Educational	Flexible classrooms	5	25 c/u	2.02	250.00
Educational	Seminar room	1	18	2.50	40.00
Educational	Multimedia Room	1	16	3.67	60.00
Educational	Learning commons	1	90	2.22	308.00
Educational	Makerspace	1	30	5.00	172.00
Educational	Professor's Rooms	1	15	3.00	39.00
	Total				969.00
Educational	Circulation	-	-	-	30%
	Total				1.200 m2
Work/Prod	Co-working	1	86	3.50	210.00
Work/Prod	Small Office	6	16	7.17	92.00
Work/Prod	Meeting Room	2	10 c/u	2.87	68.00
Work/Prod	Traning Room	1	25	2.87	61.00
Work/Prod	Reception	1	-	-	40.00
Work/Prod	Printing Room	1	-	-	21.00
Work/Prod	Lounges	1	20	3.58	113.00
Work/Prod	Lockers	-	-	-	8.00
	Total				613
Work/Prod	Circulation	-	-	-	30%
	Total				797 m2
Cultural	Auditorium	1	150	1.36	201.00
Cultural	Basic Backstage	1	-	-	43.00
Cultural	Rehersal Room	1	25	2.96	37.00
Cultural	Exhibition Room	2	100	2.22	325.00
Cultural	Memory Archive	-	-	-	45.00
Cultural	Local Workshop	3	75	2.59	188.00
Cultural	Coordination Area	1	-	-	18.48
	Total				852

Use	Space	#	Users	m2 per User	Total Area
Cultural	Circulation	-	-	-	30%
	Total				1.107
Technical	Lobby	-	60	1.74	49.00
Technical	Coffe Shop	-	90	1.74	95.00
Technical	Restrooms	-	-	-	73.00
Technical	Administration Office	-	8	-	70.00
Technical	Security Office	-	2	-	11.00
Technical	General Storage	-	-	-	30.00
Technical	Technical Rooms	-	-	-	42.00
Technical	Cleaning and Garbage Rooms	-	-	-	11.00
	Total				381
Technical	Circulation	-	-	-	30%
	Total				495
Extra	Contemplation and Elevators Area	-	-	-	572
				Built Area	4.171 m2

Figure 60 - Program Sheet. | Source: Author's elaboration

The programmatic areas presented in this proposal remain within the quantitative ranges established in the competition brief. While the distribution does not replicate the prescribed figures exactly, variations have been introduced to respond to the specific spatial logic of the project, allowing certain functions to be slightly expanded and others reduced. These adjustments are understood as calibrated design decisions rather than deviations, and all programmatic components remain within the acceptable margins defined by the brief. Overall, the proposal demonstrates that the competition requirements can be accommodated flexibly

while maintaining programmatic coherence, spatial feasibility, and functional balance.



Figure 61 - Local Workshop Room Image. | Source: Author's elaboration with Revit + Krea



Figure 62 - Internal Courtyard Image. | Source: Author's elaboration with Revit + Krea

Environmental Design Guidelines And Climatic Response

The environmental performance of the exploratory architectural proposal is structured around the mandatory guidelines established in the competition brief, particularly those related to Climate as a Designer, Improving the Environmental Protection Area, and Local Sustainable Construction Techniques. These requirements inform the project from its early design stages and are integrated as operative criteria that shape volumetric configuration, spatial relationships, and material choices, rather than being treated as supplementary technical measures.

In response to the Climate as a Designer guideline, the orientation and articulation of volumes prioritize reduced solar exposure and enhanced natural ventilation. East- and west-facing facades are minimized or protected to limit direct solar radiation, while north-south orientations concentrate larger openings to improve daylighting and cross-ventilation. Natural ventilation is reinforced through the system of internal courtyards, which function as climatic regulators, while shading strategies such as overhangs, balconies, and pergolas protect circulation areas and interior spaces from excessive heat gain. Permeable surfaces, soft landscape areas, and vegetation are incorporated throughout the site to support rainwater infiltration, reduce surface temperatures, and improve microclimatic conditions at ground level.

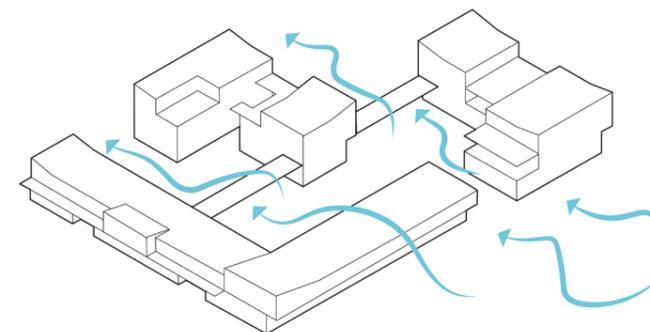


Figure 63 - Winds Diagram. | Source: Author's elaboration

The project also addresses the requirement to improve and integrate the adjacent Environmental Protection Area. Beyond compensating for tree removal, new vegetation is introduced within the internal courtyards and along the protected edge of the site to reinforce ecological continuity. Pedestrian paths are designed to extend from the public spaces of the project toward the environmental reserve, establishing both visual and physical connections that incorporate this natural edge into the everyday experience of the multimodal hub, in line with the competition's emphasis on environmental integration.

Finally, the proposal complies with the Local Sustainable Construction Techniques guideline through the prioritized use of locally sourced brick for walls and finishes, taking advantage of its thermal performance, durability, and contextual relevance. Concrete is limited to structural elements and slabs, reducing its overall environmental footprint. Additional passive strategies—such as perforated walls, ventilated corridors, and shaded outdoor spaces—support thermal comfort and controlled ventilation while minimizing the use of extensive glazed surfaces. Together, these measures demonstrate how the environmental requirements of the brief are translated into a coherent architectural system through deliberate design decisions.

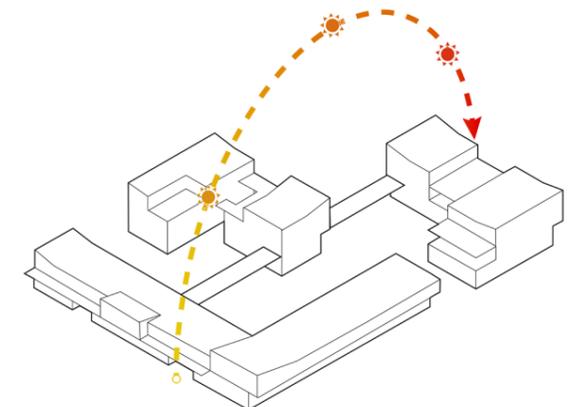


Figure 64 - Sun Path Diagram. | Source: Author's elaboration

Conclusions

Exploratory architectural proposal as a check of the call guidelines

The exploratory architectural proposal presented in this chapter operates as a design-based verification of the design principles, constraints, and requirements defined in the architectural competition framework. Through site articulation, public-space strategies, programmatic organization, and environmental responses, the project examines how the competition guidelines can be translated into an operative and coherent architectural system. In this sense, the proposal evaluates the applicability, internal consistency, and spatial feasibility of the brief in relation to metropolitan infrastructure, local urban conditions, and environmental context, rather than aiming to produce a finalized architectural design.

At the urban and architectural scale, the project confirms the central role of ground-floor permeability, continuity of public space, and controlled volumetric articulation in mediating the relationship between the Tren de Cercanías, the historic railway station, and the surrounding neighborhoods. The reconstruction of street profiles, the integration of internal courtyards, and the articulation of circulation and programmatic systems illustrate how architectural form can effectively respond to competition requirements while supporting accessibility, interaction, and functional diversity, and while respecting existing urban scales and heritage conditions. These strategies reinforce the potential of the multimodal node to operate not only as a transport interface, but also as a civic and urban place.

From a programmatic and environmental perspective, the proposal demonstrates that the competition framework is capable of accommodating diverse uses—education, culture, and work—within a flexible and adaptable spatial structure. Passive climatic strategies, material choices, and landscape

integration further test the environmental guidelines of the brief, showing how architectural decisions can contribute to thermal comfort, environmental performance, and user experience without reliance on complex technical systems.

Taken together, the exploratory proposal confirms the relevance of architecture as an operative instrument within a broader design-based research process. By testing the constraints and requirements of the competition through design, the project supports the thesis's central argument that architectural competitions can function as effective tools for validating, refining, and spatially translating metropolitan objectives into concrete architectural and territorial strategies.



Figure 65 - Reception Image. | Source: Author's elaboration with Revit + Krea



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Results

Qualitative validation of the architectural competition brief

In order to assess the clarity, coherence, and relevance of the architectural competition brief proposed as the operative outcome of this research, a qualitative validation exercise was conducted through consultation with architects external to the thesis development process. To this end, the competition brief was shared with five architects selected to represent a range of professional trajectories, levels of experience, and areas of specialization. These architects were invited to assume the hypothetical role of competition participants and to evaluate the brief based on their professional judgment. The following section outlines the professional profiles of the consulted architects, which provide the contextual framework for the qualitative results discussed below.

Interviewees Profiles

- **Howard L. Cruz Rey:** Senior architect, based in Bucaramanga, with over 30 years of professional experience. Specialized in project management and with a professional trajectory focused primarily on the development of educational facilities. This profile contributes a long-term perspective centered on feasibility, clarity of requirements, and implementation-oriented evaluation of the competition brief.
- **Isabella Montero:** Junior architect, based in Cali, with approximately four years of professional experience and a master's degree in Architecture for Sustainability. Professional practice includes medium-scale cultural, sports, and commercial projects. This profile provides insights related to sustainability-driven design criteria and contemporary architectural approaches.
- **Catalina Cadena:** Recently graduated architect, based in Bogota, holding a master's degree in Architecture for Sustainability. Academic experience includes participation in several architectural competitions, along with a strong interest in research and the exploration of new construction materials. This profile contributes a competition-oriented and exploratory design perspective.
- **Valeria Zuñiga:** Junior architect, based in Cali, with two years of professional experience and a focus on environmental and bioclimatic design. Professional work has concentrated on interior design projects for residential and commercial spaces. This profile contributes a climate-sensitive and spatially detailed reading of the brief.
- **Juan E. Garcia:** Junior architect, based in Cali, with two years of professional experience and an emphasis on urbanism and territorial planning. Professional practice includes the development of medium-scale commercial projects. This profile offers a perspective attentive to urban integration, spatial structure, and regulatory coherence.

Based on these professional profiles, the validation exercise was structured through a brief qualitative survey designed to capture their assessment of the competition brief. The consulted architects were asked to respond to a brief survey composed of three open-ended questions, aimed at evaluating: (i) the understanding of the brief and the type of proposal expected, (ii) the sufficiency and relevance of the contextual information provided, and (iii) the overall quality of the brief as a competition document. The purpose of this exercise was to examine the extent to which the proposed commission and the supporting materials were understandable, stimulating, and appropriate for professionals who, in principle, did not possess in-depth knowledge of the prior research process. The qualitative results presented in this chapter are based on the architects' written responses, which were analyzed comparatively in order to identify shared assessments, points of tension, and opportunities for refinement regarding the formulation of the competition. The complete set of responses is included in **appendix C**.

1. Understanding of the assignment

- If you were a competitor in this call, do you feel that the brief clearly explains what is expected from the project (objectives, scope, and type of proposal)? Is there anything that generates confusion or ambiguity?

The responses provided by the consulted architects reveal a clear and consistent understanding of the proposed commission. In all cases, the brief is recognized as adequately defining the general objectives of the competition, the scope of the intervention, and the type of proposal expected, with particular emphasis on the strategic and metropolitan character of the project. The participants clearly identify that the central purpose of the competition is not the design of an isolated architectural object, but rather

the conception of a multimodal node capable of articulating Jamundí with the metropolitan system associated with Cali through the Tren de Cercanías.

Across the responses, the brief is noted for successfully conveying the relationship between regional mobility challenges, Jamundí's accelerated urban growth, and the need for a structural intervention that contributes to greater functional balance within the metropolitan area. In this sense, the commission is perceived as coherent with Jamundí's current condition as a predominantly residential municipality with a high degree of functional dependence on Cali, thereby providing clear orientation for the intended project approach.

Nevertheless, one participant points to a moderate degree of ambiguity in the definition of the proposed program, particularly regarding the scale of the metropolitan-level uses requested. This observation does not undermine the conceptual clarity of the commission, but rather highlights a tension between the degree of design freedom encouraged by the brief and the level of precision typically expected in architectural competitions, especially in relation to programmatic magnitude and spatial configuration.

2. Context and available information

- Do you consider the contextual information provided (site, problem statement, theoretical framework, constraints, etc.) to be sufficient and relevant to address the project? Would you add or remove anything?

Overall, the architects agree that the contextual information provided in the brief is sufficient and relevant for addressing the project in a well-founded manner. The territorial diagnosis, the description of the

functional relationship between Jamundí and Cali, and the characterization of mobility-related challenges and access to services are all regarded as representative of the actual dynamics shaping the territory.

Positive assessments are also given to the inclusion of environmental, climatic, and heritage-related criteria, which are perceived as valuable inputs for developing architectural proposals that are sensitive to local conditions and aligned with principles of sustainability. The theoretical framework associated with multimodal mobility and transport-related facilities is recognized as providing a clear conceptual basis that guides design decisions without prescribing specific formal outcomes.

As potential areas for enhancement, some participants suggest incorporating additional layers of technical information, such as quantitative data on transport flows, references to specific regulatory frameworks, or a more detailed characterization of environmental constraints and immediate road connectivity. However, these suggestions are not framed as critical shortcomings, but rather as complementary elements that could strengthen the document in subsequent stages of development, without compromising the feasibility of the commission in its current form.

3. Overall quality of the brief

- In general terms, do you consider this to be a well-structured and stimulating competition brief? Would it motivate you to participate? Why or why not?

The responses generally characterize the brief as a well-structured, coherent and stimulating competition document. The integration of mobility infrastructure, public space, and urban facilities is recognized as a relevant approach for addressing current metropolitan challenges associated with Jamundí's relationship with Cali and the broader regional system.

The consulted architects indicate that the

commission is understandable and viable as a competition brief, noting that it departs from purely formal or isolated architectural exercises by engaging with real territorial conditions. The balance between a clearly defined problem and an open-ended project framework is identified as adequate, allowing for diverse architectural interpretations while maintaining a shared conceptual direction.

From a methodological perspective, the brief is understood as an operative framework capable of translating a territorial diagnosis into an architectural commission. Its preliminary and open character is perceived as appropriate for an exploratory competition format, in which multiple project approaches can be tested without constraining the design process through overly prescriptive requirements.

The observations identified through this validation exercise informed a subsequent refinement of the competition brief. Between the moment the brief was distributed to external participants and the final submission of the thesis, adjustments were introduced in response to the issues raised, particularly regarding the clarification of programmatic scope and the specification of contextual and technical constraints. This iterative process reinforces the understanding of the brief not as a fixed outcome, but as an evolving operative instrument, progressively calibrated through critical feedback.

Discussion

This chapter presents a transversal discussion of the main issues emerging from the thesis as a whole. Rather than addressing each chapter individually, it focuses on four overarching themes that synthesize the broader implications of the research: the Tren de Cercanías as a metropolitan trigger, the territorial and social implications for Jamundí and Cali, hypothetical scenarios of metropolitan transformation, and the role and limits of architecture within these dynamics. Together, these discussion points allow the research to move beyond descriptive analysis and design propositions, offering a critical reflection on metropolitan transformation processes and the operational capacity of architectural intervention within them.

1. The Tren de Cercanías as a metropolitan trigger

The Tren de Cercanías could operate as a trigger for multiple urban and territorial dynamics across different dimensions, including everyday mobility, the formation of urban centralities, land markets, and metropolitan governance structures.

First, and most evidently, the implementation of the railway system would directly affect mobility dynamics. The introduction of a high-capacity mass transit mode could contribute to reducing dependence on private vehicles in daily commutes between Jamundí and Cali, as well as to the partial substitution of existing informal transport services. In addition, the higher frequency and capacity of the system could generate changes in travel schedules, redistributing commuter flows that are currently concentrated within narrow peak-hour windows into broader time frames. However, for these effects to materialize, social and cultural factors related to public transport use must also be considered. Public trust in the system and perceptions of reliability and efficiency are critical variables, particularly in a context where recent surveys indicate limited confidence in the punctuality and performance of the existing public transport system (MIO) (citation).

In relation to urban centralities and land-use patterns, the Tren de Cercanías could function as a catalyst for the emergence of new centralities around station areas, as proposed in this thesis. Comparative urban experience shows that transport nodes often attract commercial activities, services, and public facilities, fostering increased urban intensity and functional diversity. This could translate, for example, in the enhancement of access to employment, education, leisure, and cultural opportunities for both Jamundí residents and populations traveling from other parts of the metropolitan area. However, this dynamic can be understood as a symbiotic relationship: while railway infrastructure may stimulate the location of new activities, its effective operation also depends on the presence of destinations that motivate citizens to use the system. In this sense, the consolidation of metropolitan-scale services, employment opportunities, and facilities in Jamundí is essential if the railway is to support not only outbound commuting toward Cali but also greater permanence and activity within the municipality itself, thereby contributing to a partial reconfiguration of the current center-periphery relationship that characterizes the Jamundí-Cali connection. Without such articulation, the infrastructure risks reinforcing existing patterns of functional dependence rather than transforming them.

A third area of impact concerns governance.

The implementation of the Tren de Cercanías poses significant challenges, as it is a project that crosses municipal boundaries and exceeds traditional administrative limits. Its operation would require sustained intermunicipal coordination and the strengthening of metropolitan governance mechanisms capable of integrating decisions related to mobility, land use, and the provision of facilities, as well as control in land market dynamics. Urban development experience demonstrates that investments in mobility infrastructure, public services, and major facilities frequently lead to land value increases in surrounding areas, accompanied by heightened interest in residential and tertiary development (citation). While such processes may be interpreted as indicators of urban dynamization, when they occur in the absence of appropriate land management instruments they can result in speculative practices, rising property values, and the progressive displacement of lower-income populations, thereby intensifying socio-spatial inequalities. In the absence of such coordination frameworks, the territorial impacts of the project risk becoming fragmented or misaligned with existing local dynamics.

In sum, the Tren de Cercanías has the potential to activate meaningful transformation processes across multiple dimensions. However, the implementation of railway infrastructure alone does not guarantee a structural transformation of the territory, nor an automatic reduction in Jamundí's functional dependence on Cali. These outcomes would only be achievable if the project is accompanied by active policies aimed at redistributing services, activities, and opportunities within the metropolitan system.

2. Territorial and social implications for Jamundí and Cali

The processes associated with increased metropolitan connectivity are likely to produce a number of distinct territorial and social effects, whose relevance lies not in their technical dimensions, but in the differentiated ways they may reshape access to opportunities,

spatial hierarchies, and social conditions within Jamundí and Cali.

A first and central implication concerns the selective concentration of opportunities within the metropolitan territory. As previously stated, improvements in connectivity tend to favor areas that are already strategically positioned or that become newly central within the network, concentrating services, employment, and public investment around specific nodes. While this concentration may enhance efficiency and visibility at the metropolitan scale, it also risks producing uneven patterns of access, privileging populations located near these areas while leaving other sectors structurally disconnected. In Jamundí, this dynamic may generate internal asymmetries, whereby certain zones emerge as new focal points of activity, while others continue to function primarily as residential areas with limited access to metropolitan-scale opportunities.

In relation to the above, a second implication relates to socio-spatial restructuring driven by land valorization. The concentration of opportunities in well-connected areas often translates into increased land values and intensified development pressures. These processes can alter residential dynamics by favoring higher-income groups and capital-intensive projects, while progressively displacing lower-income populations through indirect mechanisms such as rising rents and changes in land use. In this sense, the transformation of accessibility and centrality does not only reorganize space, but also redefines who can remain within strategically located areas, reinforcing patterns of social exclusion if land management instruments are not implemented.

A third territorial implication of the Tren de Cercanías concerns the redefinition of the functional relationship between Jamundí and Cali. While increased connectivity has the potential to support a transition toward a more balanced and polycentric metropolitan

structure, it may also reinforce Jamundí's role as a commuter municipality if not accompanied by a strategic reorientation of local urban development. In such a scenario, improved mobility would primarily facilitate daily displacement toward Cali, intensifying flows and activities around station areas without consolidating local functional centralities. One tangible manifestation of this failure would be the risk of infrastructural overload: the concentration of metropolitan-scale demand on road networks, public space, and basic urban and environmental services that were not designed to absorb such intensity. In a context of rapid growth and already strained infrastructure, this mismatch would compromise urban performance and environmental resilience, illustrating how enhanced connectivity, rather than transforming the Jamundí-Cali relationship, could ultimately deepen existing patterns of functional dependence.

Taken together, these territorial and social implications reveal that increased metropolitan connectivity is not, in itself, a neutral or inherently balanced process. The concentration of opportunities, the restructuring of land markets, and the reconfiguration of the functional relationship between Jamundí and Cali are deeply interconnected dynamics whose outcomes depend on how they are governed and spatially articulated. Without coordinated planning instruments capable of regulating land use, infrastructure capacity, and the distribution of activities, improved connectivity may amplify existing asymmetries rather than mitigate them. Understanding these implications as structurally linked processes provides a critical framework for evaluating not only the potential benefits of the Tren de Cercanías, but also the risks associated with its implementation in the absence of a broader metropolitan development strategy.

3. Hypothetical scenarios of metropolitan transformation

In order to explore the potential territorial

trajectories associated with the implementation of the Tren de Cercanías, this section outlines three hypothetical scenarios of metropolitan transformation. These scenarios do not aim to predict future outcomes, but rather to illustrate plausible configurations resulting from different degrees of articulation between transport infrastructure, land-use planning, and metropolitan governance. By contrasting these scenarios, it becomes possible to clarify the conditions under which increased connectivity may contribute to a more balanced metropolitan structure or, conversely, reinforce existing patterns of dependence and inequality.

Scenario A: Tren de Cercanías with active urban centralities

In this scenario, the implementation of the Tren de Cercanías is accompanied by deliberate policies aimed at consolidating active urban centralities around station areas, particularly within Jamundí. Transport infrastructure is complemented by the strategic localization of metropolitan-scale services, productive activities, and public facilities, fostering functional diversity and sustained urban intensity.

Under these conditions, station areas operate not only as points of transit, but as destinations in their own right, supporting everyday activities such as work, education, cultural exchange, and social interaction. Improved accessibility is leveraged to attract investment while being regulated through planning instruments that promote mixed uses and mitigate speculative pressures. As a result, Jamundí strengthens its role within a polycentric metropolitan system, reducing its dependence on Cali and supporting a more balanced distribution of opportunities across the territory.

Scenario B: Tren de Cercanías without redistribution of services

In a second scenario, the Tren de Cercanías is implemented primarily as a mobility project, without significant redistribution of services

or activities beyond existing metropolitan cores. While connectivity between Jamundí and Cali improves, employment, education, and specialized services remain largely concentrated in Cali.

In this context, enhanced mobility primarily facilitates daily commuting rather than territorial transformation. Jamundí continues to function predominantly as a residential municipality, with station areas acting mainly as transfer points rather than active urban centers. Although travel times may be reduced, the absence of local opportunities limits the potential for functional diversification. Consequently, increased connectivity risks reinforcing existing patterns of metropolitan dependence, while placing additional pressure on transport systems and local infrastructure without delivering substantial gains in local autonomy.

Scenario C: Infrastructure without metropolitan governance

The third scenario considers the implementation of the Tren de Cercanías in the absence of effective metropolitan governance mechanisms. While the infrastructure physically connects multiple municipalities, decision-making related to land use, infrastructure capacity, and service provision remains fragmented across administrative boundaries.

In this scenario, station areas develop in an uneven and uncoordinated manner, driven primarily by market forces rather than strategic planning. Disparities in regulatory frameworks and investment priorities generate spatial inconsistencies, infrastructural overload, and heightened socio-spatial inequalities. The lack of a shared metropolitan vision undermines the transformative potential of the railway system, resulting in localized benefits that fail to translate into coherent territorial restructuring at the metropolitan scale.

By organizing the previously discussed

dynamics into distinct scenarios, this chapter provides a structured way of understanding how different combinations of infrastructure, land use, and governance produce specific territorial outcomes. Rather than treating mobility, accessibility, land markets, and functional dependence as isolated issues, the scenarios group these processes into coherent configurations of causes and effects, clarifying their cumulative impacts at the metropolitan scale. Within this spectrum, the thesis positions the architectural competition and the proposed multimodal node as an operative response aligned with Scenario A, seeking to translate metropolitan objectives into spatial, programmatic, and architectural strategies capable of activating new urban centralities within Jamundí.

4. Role and limits of architecture within these dynamics

The metropolitan dynamics discussed in the previous sections underscore the need to reconsider the role of architecture in contexts shaped by large-scale infrastructure and territorial transformation. Within processes driven by increased connectivity, land valorization, and shifting functional relationships, architecture cannot operate as an autonomous or self-sufficient intervention. Instead, it functions as a spatial mediator capable of translating metropolitan objectives into tangible urban configurations, while remaining subject to broader structural constraints.

From this perspective, architecture can play a strategic role in the activation of new urban centralities. Through the deliberate organization of programs, public space, and spatial interfaces, architectural interventions can support functional diversity, intensify urban life, and provide physical anchors for metropolitan-scale activities. In the context of Jamundí, architecture has the capacity to articulate transport infrastructure with everyday urban uses, enabling station areas to operate as destinations rather than mere

points of transit. By concentrating educational, cultural, productive, and civic functions, architectural projects can contribute to redefining the municipality's position within the metropolitan system.

At the same time, the capacity of architecture to influence territorial dynamics is inherently limited. Architectural projects alone cannot redistribute employment, regulate land markets, or resolve structural inequalities embedded in metropolitan governance frameworks. Without complementary policies addressing land use, housing, infrastructure capacity, and social inclusion, architectural interventions risk becoming isolated objects or catalysts for speculative development. In this sense, architecture may shape local spatial conditions, but it cannot, by itself, determine broader patterns of accessibility, affordability, or functional balance.

These limitations highlight the importance of understanding architecture as part of a larger assemblage of planning instruments rather than as an end in itself. Within this framework, the architectural competition developed in this thesis is conceived as a preliminary tool. The competition operates as a mechanism for exploring spatial and programmatic responses to complex metropolitan challenges, translating abstract territorial objectives into concrete design questions. However, its outcomes remain contingent upon institutional capacity, regulatory frameworks, and long-term implementation strategies that extend beyond the scope of architectural design.

By framing architecture as an operative yet constrained component within metropolitan transformation processes, the thesis positions the competition not as a definitive solution, but as a critical interface between analysis, projection, and implementation. This approach reinforces the understanding of architecture as an enabling discipline-capable of shaping urban form and experience-while acknowledging the limits of its agency within broader territorial and governance dynamics.

Conclusions

This thesis examined the emerging metropolitan structure of the Área Metropolitana del Suroccidente de Colombia, focusing specifically on the Tren de Cercanías project and its implications for the functional relationship between Cali and Jamundí. Through territorial analysis, the research demonstrated that Jamundí currently operates as a dependent commuter municipality, characterized by rapid residential growth that has not been matched by a corresponding consolidation of employment opportunities, services, or metropolitan-scale facilities. This imbalance reinforces daily mobility pressures and limits Jamundí's capacity to function as an autonomous urban center within the metropolitan system.

Building on this diagnosis, the thesis analyzed the Tren de Cercanías as a strategic infrastructural project with the potential to reshape mobility patterns and territorial relationships at the metropolitan scale. Rather than assuming the railway as an inherently transformative intervention, the research highlighted that its impacts depend on how transport infrastructure is articulated with land use, service distribution, and governance frameworks. In this context, the study argued that architecture can play a meaningful role in mediating between metropolitan objectives and local urban conditions, particularly through the activation of station areas as multifunctional urban nodes.

A central contribution of the thesis lies in its methodological approach. Instead of developing a single architectural design, the research constructed an architectural competition as an operative instrument for metropolitan intervention. The call for architects was carefully structured as a brief that translated territorial analysis, theoretical principles, and infrastructural constraints into a set of spatial and programmatic guidelines. This approach positioned the competition

not as an end product, but as a mechanism for testing and communicating complex urban strategies through architectural terms.

The feasibility and clarity of this instrument were subsequently assessed through a qualitative validation process involving external architects. The responses confirmed that the brief was generally comprehensible, coherent, and capable of conveying the intended metropolitan objectives, while also revealing areas where greater precision could strengthen its operative capacity. The iterative refinement of the brief based on this feedback reinforced the understanding of architectural commissions as evolving tools, shaped through critical exchange rather than fixed prescriptions.

Finally, the discussion chapter articulated a critical stance toward the territorial and social implications of increased metropolitan connectivity. By organizing these implications into scenarios, the thesis demonstrated that infrastructure alone does not guarantee balanced development and may, in some cases, reinforce existing asymmetries if not accompanied by coordinated planning and governance. Within this framework, the architectural competition and the proposed multimodal node were positioned as aligned with a scenario that seeks to support active urban centralities in Jamundí, while acknowledging the limits of architectural agency in addressing structural metropolitan challenges.

In conclusion, this thesis contributes to contemporary debates on metropolitan planning by framing architecture not as a final solution, but as a design-based research instrument capable of articulating, testing, and discussing territorial strategies. Through the construction and validation of an architectural competition and an exploratory design proposal, the research advances a design-

based proposal that translates metropolitan objectives into operative spatial frameworks. This approach demonstrates how architectural tools can support more integrated and context-sensitive responses to mobility, land use, and urban centrality, while explicitly acknowledging the limits of architectural agency within broader institutional, social, and governance dynamics.

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Multimodal Urban Hub

Call for Architects

Introduction

Multimodal Urban Hub

In this thesis, the concept of a multimodal urban hub is understood not as a single, self-contained building, but as a spatial system composed of multiple interconnected elements. Rather than concentrating all functions within a single architectural object, the proposed hub operates as a network of smaller buildings, public spaces, and circulation structures that together form a cohesive urban infrastructure.

The hub is described as multimodal both in terms of mobility and programmatic diversity. At the infrastructural level, it is directly linked to the new Tren de Cercanías station, functioning as a key interface between metropolitan rail services, local mobility, and pedestrian networks. At the same time, it establishes a spatial and functional relationship with the former railway station, which is reactivated as a community and cultural facility. This dual connection allows the hub to mediate between new and existing infrastructures, reinforcing continuity rather than rupture within the urban fabric.

Programmatically, the multimodal hub integrates cultural, educational, and work-related uses, distributed across different volumes and public spaces. This mix of activities is intended to support daily urban life beyond peak commuting hours, fostering permanence, interaction, and functional diversity. By dispersing these programs across a network of buildings rather than concentrating them in a single structure, the hub promotes permeability, flexibility, and adaptability over time.

In this sense, the multimodal urban hub functions as an operative framework rather than a fixed architectural form. It provides the spatial conditions necessary for mobility, social interaction, and service provision to coexist, while allowing different architectural

interpretations to emerge within a shared set of guidelines. This understanding underpins the construction of the architectural competition, framing it as a tool to explore how architecture can contribute to integrated and context-sensitive metropolitan interventions.

The Objective and Strategies

To develop

The objective is to propose and develop a multimodal facility in Jamundí that is strategically integrated with the Commuter Rail's central station, and that addresses the needs of the sector in order to provide metropolitan-scale services and promote functional balance within the metropolitan region of Southwestern Colombia.

For this matter participants will also need to:

- **Analyze:** The current and projected mobility demands of Jamundí and the metropolitan region to identify the requirements that the multimodal facility must address.
- **Define:** The optimal spatial, functional, and operational integration between the multimodal facility and the Commuter Rail's central station to ensure efficient passenger flow and connectivity.
- **Develop:** An architectural and urban space proposal that supports metropolitan-scale services, enhances accessibility, addresses local climatic conditions through sustainable design approaches, and promotes land-use synergies in the surrounding area.

The following strategies establish the design principles that will guide the development of the multimodal facility, ensuring its functional integration, sustainability, and suitability for the local context.

- **Strategically Connected** to the station to ensure optimal accessibility for various user profiles.
- **Effectively Addressing** the local demands for uses and activities.

- **Properly integrated** into its setting, respecting local materials, techniques and styles.
- **Sustainably designed**, both environmentally and economically, by employing passive design strategies and local materials.
- **Flexible and scalable**, making it possible to accommodate future growth.
- **Durable**, to ensure the building's longevity and minimize maintenance needs.
- **Climate-adapted**, able to withstand the tropical climatic conditions of Jamundi, prioritizing natural sun and ventilation.
- **Culturally sensitive**, integrating with the local context and fostering a sense of belonging and pride within the community.

01

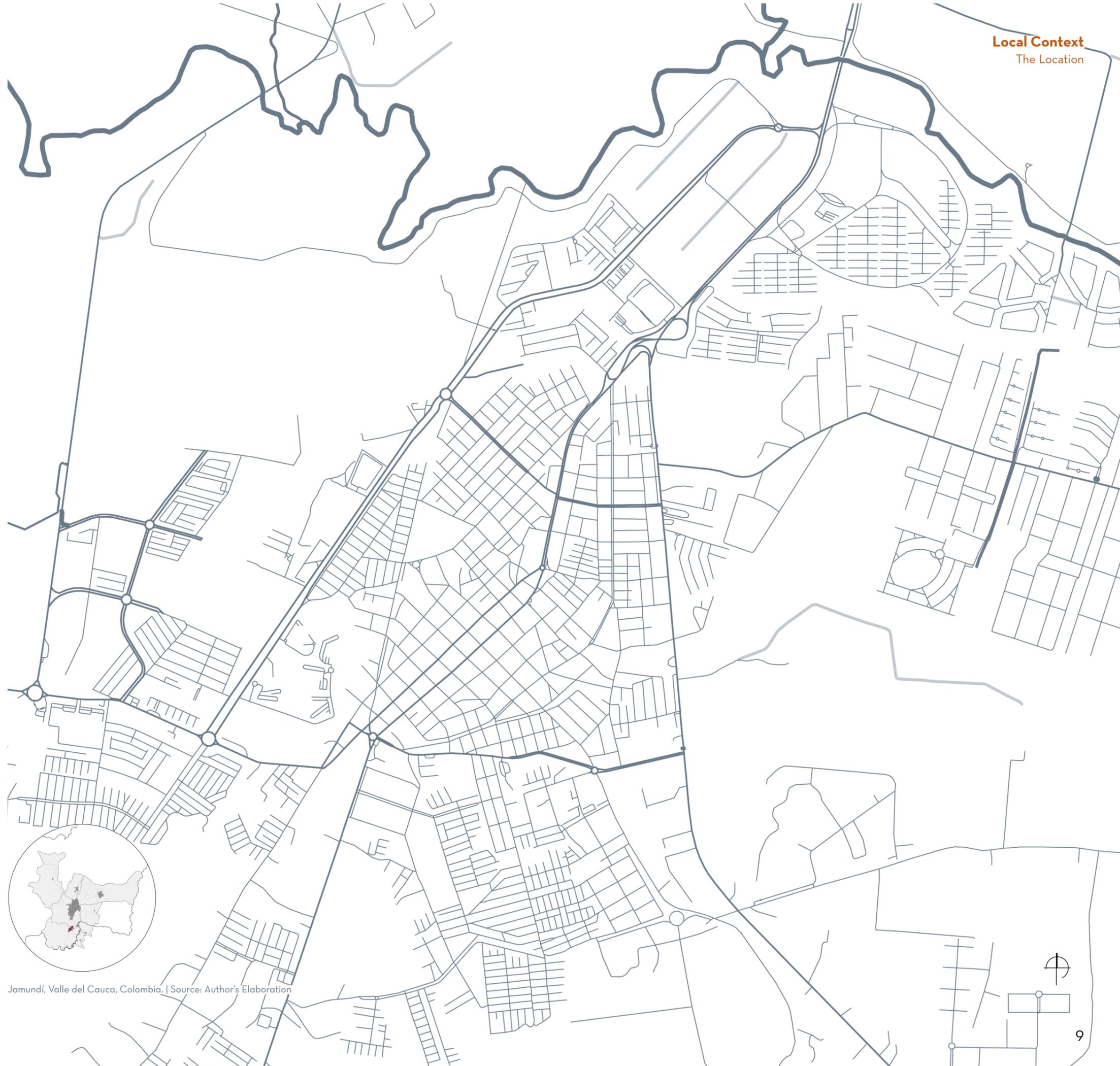
Local Context

The Location

Jamundí, Colombia

Jamundí is one of the most relevant municipalities in the southern region of Valle del Cauca due to its strategic location as a gateway to the Pacific region and its direct connection to the city of Cali. With an estimated population exceeding 185,000 inhabitants and one of the fastest demographic growth rates in the metropolitan area, Jamundí has absorbed a significant share of the residential expansion generated by Cali. In recent decades, the municipality has increasingly become a destination for population seeking more affordable housing and access to employment opportunities, transforming historically agricultural landscapes into expanding urban areas. This position grants Jamundí a fundamental role in regional balance, as its urban, economic, and environmental development directly impacts the sustainability of the broader metropolitan territory.

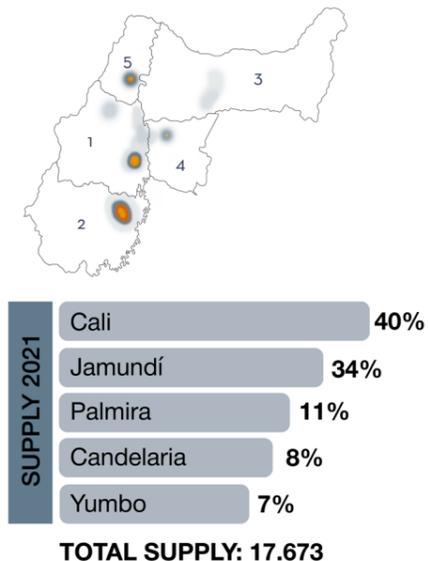
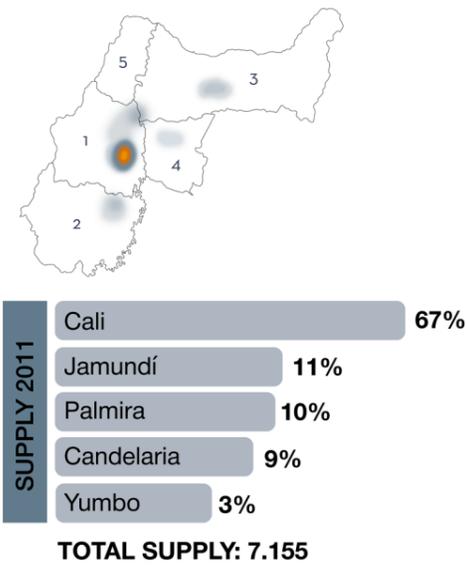
The territorial context of Jamundí combines productive agricultural land—particularly sugarcane and fruit cultivation—with environmentally valuable natural systems such as river corridors and forested hills, which play an important ecological role at the regional scale. While agriculture remains a significant component of the local economy, Jamundí has experienced increasing diversification through the growth of commercial, logistics, and service-related activities associated with its connectivity to Cali and the broader Pacific economic corridor. Despite this dynamism, the municipality continues to face structural challenges related to urban expansion, mobility demand, and the equitable distribution of metropolitan-scale services.



Jamundí, Valle del Cauca, Colombia. | Source: Author's Elaboration

In recent years, these challenges have been intensified by accelerated demographic change driven largely by migration. Statistical and spatial analyses indicate that Jamundí has experienced one of the highest population growth rates in the region, largely associated with internal migration from Cali and surrounding municipalities. This process has been strongly linked to the availability of new housing developments, particularly social-interest housing, which has positioned Jamundí as a residential alternative within the southern metropolitan corridor. As a result, the municipality has increasingly consolidated a residential profile, while many metropolitan-scale services, employment opportunities, and specialized facilities remain concentrated in Cali.

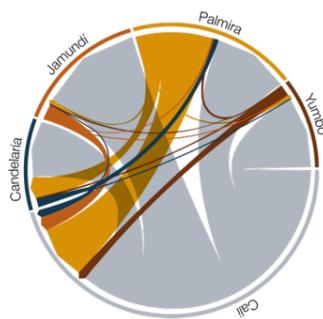
Mobility patterns clearly reflect this asymmetric relationship. The functional connection between Cali and Jamundí is structured primarily along the Cali-Jamundí corridor, supported by the Panamerican Highway and the Cali-Jamundí road axis, which operate as the backbone of daily commuting flows. Mobility data reveal a strong pattern of pendular movement, with a significant proportion of Jamundí's workforce commuting daily to Cali for employment, education, healthcare, and specialized services. This dynamic reinforces Jamundí's role as a commuter municipality within the Southern Metropolitan Area and generates increasing pressure on road infrastructure and transport systems.



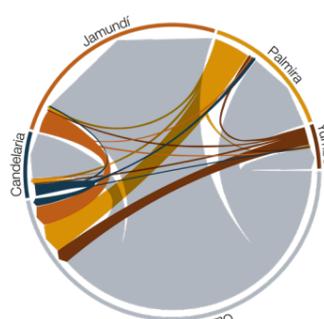
- 1 Cali
- 2 Jamundí
- 3 Palmira
- 4 Candelaria
- 5 Yumbo

Social Housing relocation in 10 years - 2011 to 2021 . | Source: Author's own elaboration with data from on Alcaldías del AMSO (2024).

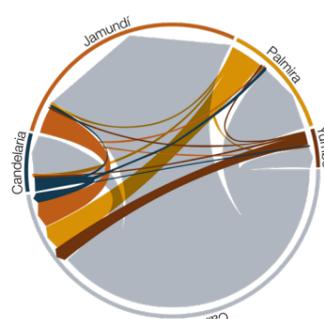
Migration from place of birth



Migration from 2012



Migration from 2017



Migratory flows between Cali, Candelaria, Jamundi, Palmira and Yumbo. | Source: Author's own elaboration with data from "La información del DANE en la toma de decisiones de los municipios del país - Candelaria, Jamundí, Palmira, Yumbo - Valle del Cauca" (DANE 2020)

At present, the absence of a fully integrated mass transit system between Cali and Jamundí has further deepened this dependence. While Cali's MIO system structures mobility within the city, it does not yet extend into Jamundí, forcing residents to rely predominantly on private vehicles, motorcycles, or informal transport options. This condition has led to congestion along the main corridors and longer travel times, highlighting the urgency of improving public transport connectivity at the metropolitan scale.

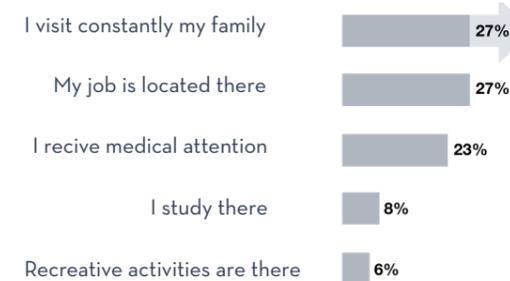
In response to these dynamics, recent planning initiatives have emphasized the need to strengthen regional mobility infrastructure. The approval of the "Tren de Cercanías" project represents a strategic intervention aimed at addressing the growing demand for mass transit along the Cali-Jamundí corridor. Designed to operate parallel to existing road infrastructure and to connect Jamundí with Cali, Yumbo, and Palmira, the project seeks not only to support daily commuting flows

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CITIZEN PERCEPTION
SURVEY JAMUNDÍ 2023

To which neighboring city or municipality do they move?



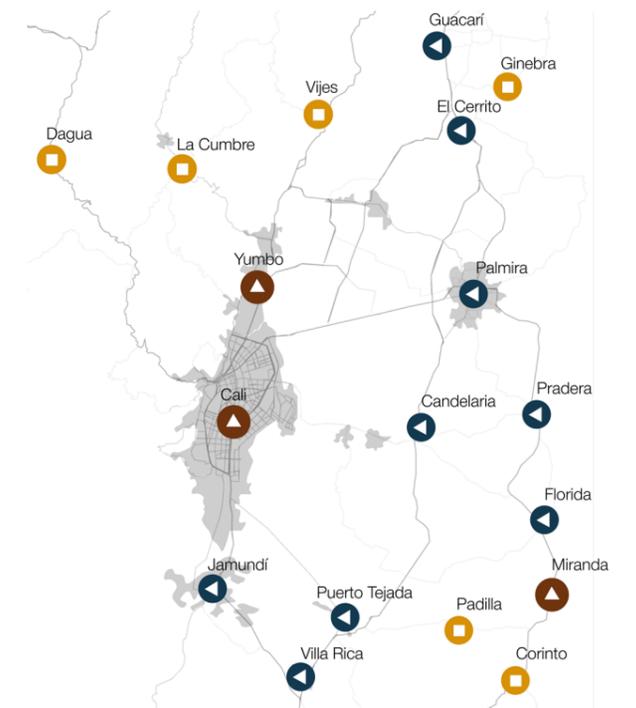
Main reasons for moving outside the municipality



Citizen perception survey in Jamundí | Source: "Encuesta de percepción ciudadana en Jamundí" (Yanhaas and Cali Cómovamos 2023)

but also to restructure patterns of urban development. By leveraging existing railway infrastructure, the project opens opportunities for the reactivation of historic stations and the consolidation of new urban centralities linked to public transport.

Overall, the convergence of rapid population growth, housing-driven migration, and intense pendular mobility has positioned Jamundí as a key territory within the metropolitan system. While residents benefit from more affordable housing and proximity to Cali, the municipality remains functionally dependent on the metropolitan core. These conditions underscore the need to rethink Jamundí's role beyond that of a residential extension, promoting urban strategies that integrate mobility, local services, and emerging centralities to reduce dependence and enhance territorial balance within the metropolitan region.



- ▲ High Attraction of Workers
- Moderate Inflow and Outflow of Workers
- Low Inflow, High Outflow of Workers

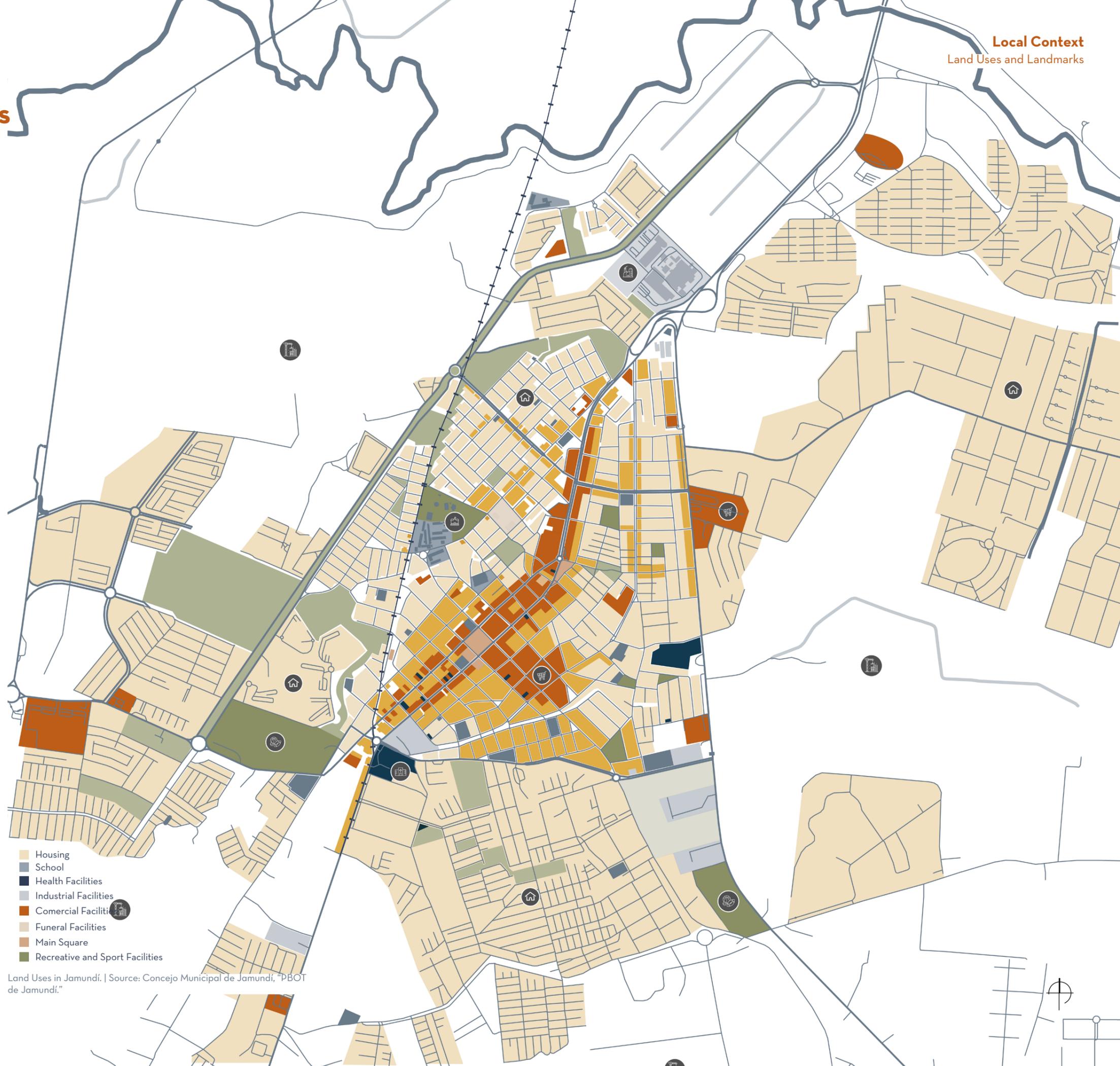
Workforce commuting in the municipalities within the territorial space. | Source: Author's own elaboration with data from Cali Ciudad-Región Ampliada: Un Territorio Metropolitano (Galeano Loaiza 2019)

Land Uses and Landmarks Within Jamundí

Regarding land use, the analysis reveals that most of Jamundí remains predominantly residential. However, an increasing number of housing units have adapted their ground floors for commercial activities while maintaining residential uses on upper levels, resulting in a growing presence of mixed-use development. Public facilities and exclusively commercial activities, by contrast, remain largely concentrated in the historic and administrative center. As a result, many peripheral neighborhoods depend on a limited number of central destinations for education, healthcare, retail, and administrative services, increasing travel distances and concentrating daily movement along a small number of primary corridors.

In addition, Jamundí hosts several industrial facilities embedded within the urban fabric, which represent a significant source of local employment and contribute to the city's productive base. The educational offer, however, is largely limited to elementary and secondary levels, with a notable lack of higher education institutions. Only recently has the construction of a new SENA campus begun in the southern part of the city, yet the municipality would greatly benefit from a more distributed presence of higher education facilities across its territory. Finally, although Jamundí is a relatively small city, it possesses a well-recognized heritage system, including four strictly protected buildings and a formally regulated heritage conservation area.

Taken together, these conditions reveal a clear imbalance in the distribution of activities and land uses within the city. This reinforces a structural dependence on Cali for employment opportunities and higher-order services, as local opportunities and specialized facilities are not evenly distributed across the municipal territory.



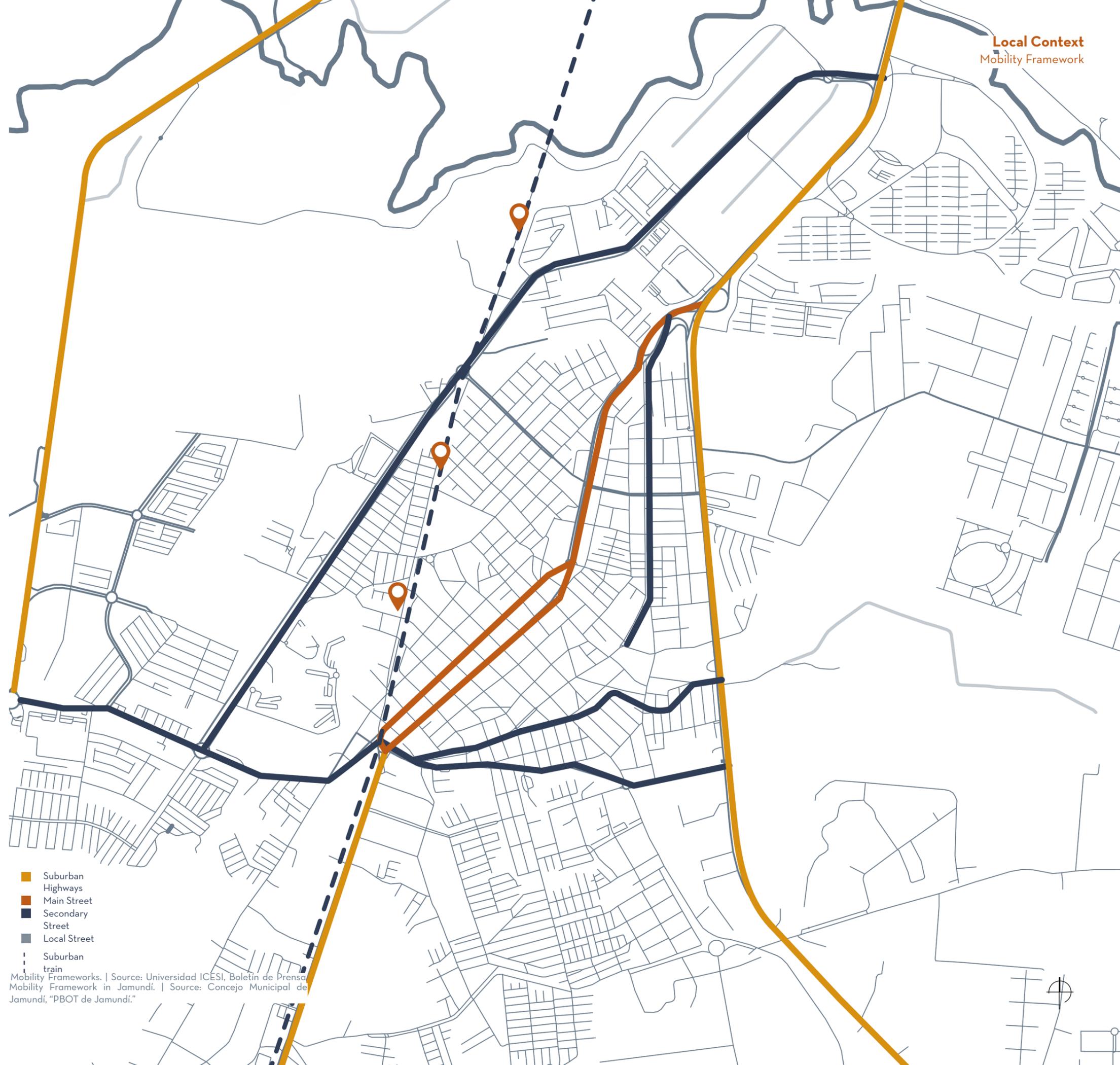
Land Uses in Jamundí. | Source: Concejo Municipal de Jamundí, "PBOT de Jamundí."

Mobility Frameworks Within Jamundí

Jamundí's mobility system is organized through a clear hierarchy. At the metropolitan scale, suburban highways and the main north-south corridor concentrate most regional movements and channel daily flows toward Cali. Inside the municipality, secondary and local streets connect neighborhoods, but their continuity is often fragmented and their capacity is limited, so many trips end up concentrating on a few collector corridors, reducing travel-time reliability during peak hours.

In this context, the proposed suburban train line, shown by the dashed route, introduces a structural shift by adding a high-capacity, predictable alternative to road-based commuting. It can redistribute regional demand, improve access for residents who travel daily for work, education, and services, and strengthen intermodal connections through safer and more direct pedestrian, cycling, and feeder links.

The three projected stations within Jamundí should be understood as strategic urban anchors. Beyond functioning as stops, they can organize transfers, concentrate services, and support new centralities around public transport, helping reduce car dependency and promoting a more connected and balanced urban structure.



Mobility Frameworks. | Source: Universidad ICESI, Boletín de Prensa
Mobility Framework in Jamundí. | Source: Concejo Municipal de
Jamundí, "PBOT de Jamundí."

Identified Issues

Local and Metropolitan scale



Traffic. | Source: Occidente, "¿A qué se debe el colapso del tráfico en el Sur de Cali?"

Mobility and Congestion

Jamundí relies heavily on its connection to Cali, causing traffic congestion on its main access roads. The internal road infrastructure is insufficient, and public transportation options are limited, making daily mobility difficult for residents.



Services. | Source: "Jamundí Suma Esfuerzos Por Su Recuperación; Estas Son Las Estrategias - El País."

Lack of services and facilities

Despite its demographic growth, the municipality still lacks sufficient public spaces and educational, cultural, healthcare, and recreational facilities. The uneven distribution of these services forces many residents to travel to other municipalities, especially Cali, to meet basic needs. This situation highlights the urgency of planning a more balanced, self-sufficient, and equipped urban structure.



Traffic. | Source: Author's Elaboration

Urban Security

Rapid urban growth and the expansion of new residential areas without adequate urban design have created spaces with low institutional presence and limited community interaction. Poor lighting, weakly defined public spaces, and the lack of community facilities contribute to perceptions of insecurity and weaken social cohesion in everyday life.

Identified Advantages

Local and Metropolitan scale



Culture. | Source: El País, "Festival del Cholado en Jamundí: así será la nueva edición de esta fiesta"

Culture

Cultural identity is a defining component of social life in the Valle del Cauca and a key asset for Jamundí. Local traditions strengthen belonging and collective memory through everyday practices. In this context, the cholado operates as a recognizable cultural reference that expresses local identity while remaining connected to wider regional traditions.



Biodiversity. | Source: Alcaldía Municipal de Jamundí, "Sala de Prensa."

Biodiversity

Jamundí is part of the Valle del Cauca, a region surrounded by major natural reserves and ecological corridors. This context supports a high diversity of flora and fauna and shapes the landscape character of the municipality. Biodiversity is therefore an asset that can guide more sustainable growth, especially when natural systems are protected and integrated into urban development decisions.



Urban Growth. | Source: El País, "El impresionante desarrollo urbano que se construye en el sur de Cali."

Urban Growth

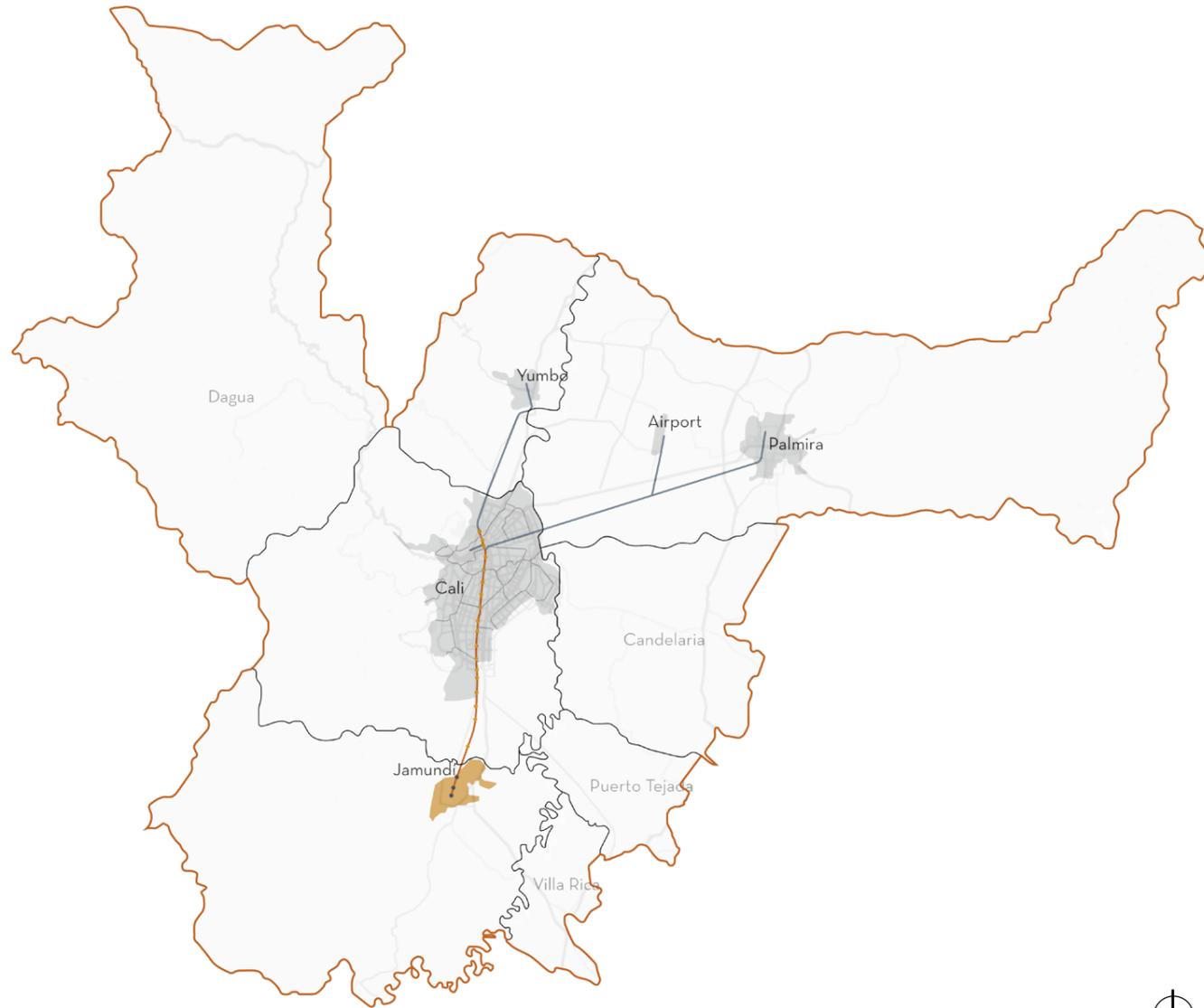
Jamundí has been growing rapidly within the regional dynamics of the Valle del Cauca, largely driven by housing demand linked to southern Cali. While this expansion creates pressure on infrastructure, it also strengthens the case for improving local services and consolidating public spaces and facilities that can support safer, more active urban life over time.

02

The Train Project Incorporation

The "Tren de Cercanías" project

Metropolitan city scale



"Tren de Cercanías" Sections - Metropolitan Scale. | Source: Author's elaboration

The Tren de Cercanías is a regional mobility project that aims to improve the daily flows between the municipalities of Cali, Yumbo, Jamundí, and Palmira.

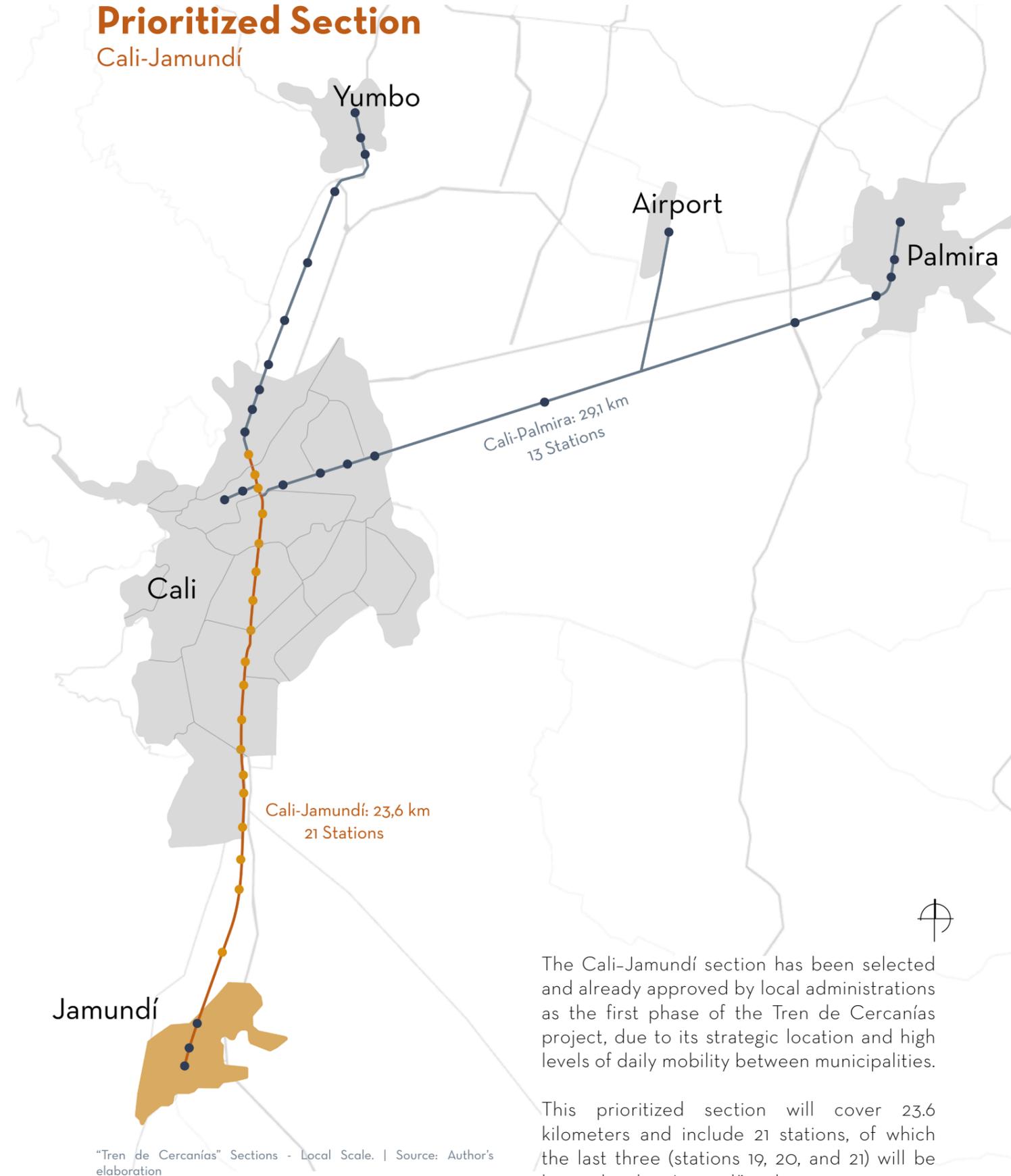
The system is designed to operate as a tram-type train, with two main lines: a north-south corridor connecting Yumbo, Cali, and Jamundí, and an east-west line linking Cali

with the airport and the municipality of Palmira.

The network will extend for 73.4 kilometers total and include 48 stations, 11 of which will integrate directly with Cali's public transport system, MIO.

Prioritized Section

Cali-Jamundí



"Tren de Cercanías" Sections - Local Scale. | Source: Author's elaboration

The Cali-Jamundí section has been selected and already approved by local administrations as the first phase of the Tren de Cercanías project, due to its strategic location and high levels of daily mobility between municipalities.

This prioritized section will cover 23.6 kilometers and include 21 stations, of which the last three (stations 19, 20, and 21) will be located within Jamundí's urban area.



Train Typology

The system

The train proposed for the project will be a tram-type model, designed for urban and regional operation. It will have a capacity of approximately 1,000 passengers, with an average width of 2.65 meters and a total length of 100 meters.

The system will operate as a single-cabin, electric train powered by catenary, with a maximum design speed of 110 km/h. Its traction system will function through 1,500 VCC electrification, ensuring efficient performance and reduced emissions.

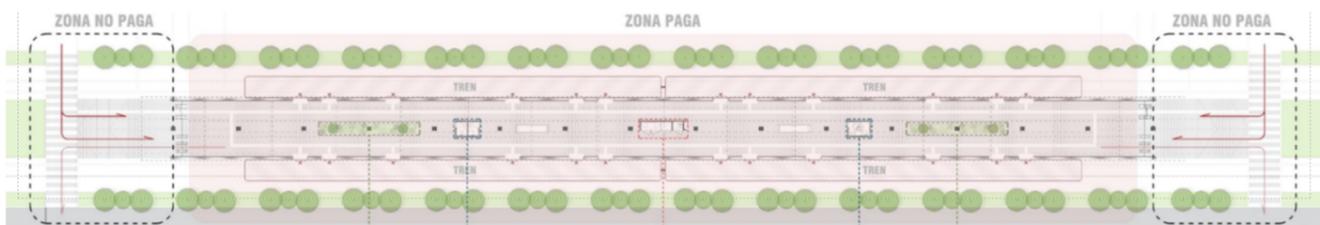
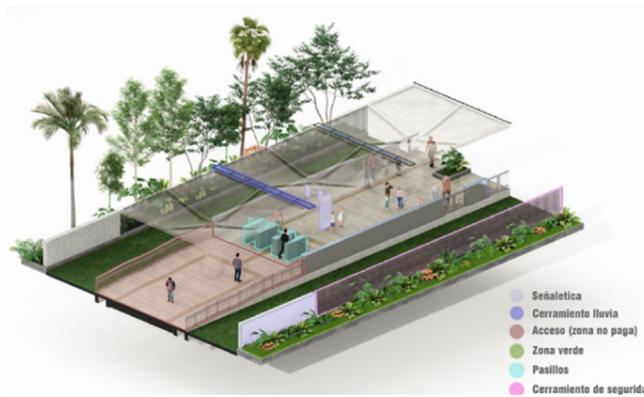


Bilbao's Streetcar. | Source: "El tranvía de Bilbao anuncia cambios en su recorrido por la renovación de las vías," Crónica Vasca, July 26, 2022

Station Typology

The stop

The typology proposed for the station measures approximately 20 meters wide and 150.5 meters long. Incorporates lateral safety enclosures, green buffer zones, and a light canopy roof structure that facilitates natural ventilation and provides comfort in the region's warm climate. Within the platform area, the stations include technical rooms, restrooms, and landscaped areas.



Plan and Axonometry of the proposed station. | Source: Gobernación del Valle del Cauca, "Proyecto Tren de Cercanías Del Valle Del Cauca- TCV."

Imaginary Type Station. | Source: Gobernación del Valle del Cauca, "Proyecto Tren de Cercanías Del Valle Del Cauca- TCV."



Government proposal

Current Situation and the project

This map illustrates the existing conditions of Jamundí's railway corridor before the implementation of the Tren de Cercanías project. The proposed line follows the former railway line, where the project will include three new stations for Jamundí (stations 19, 20, and 21).

From the center of the rail corridor, the government currently owns a strip of 11.5 meters on each side, totaling approximately 23 meters of urban profile to develop the train project. The new infrastructure will require around 20 meters of this space for the railway profile. However, as the existing corridor currently has a width of 15 meters from sidewalk to sidewalk, it will be necessary to acquire an additional 8 meters, affecting certain plots currently occupied by buildings. This situation requires understanding the infrastructure not as an isolated element, but as an integrated urban intervention capable of restructuring the surrounding space.

--- Central line
— Estate's property



Regarding stations, Jamundí will have three, each strategically located according to the existing urban structure and local land uses.

Station 19: located next to the SENA campus, a major institution for technological and higher education, and near the municipality's industrial area.

Station 20: at Carrera 18 and Calle 16, between a residential sector and a school and sports complex.

Station 21: the final and central station of the prioritized section, is situated near Jamundí's city center and municipal hospital, in proximity to the former railway station, a heritage site of local importance.

Regarding the approach of the competition, two key strategic decisions were made in response to the contextual and territorial analysis. The first decision involves a slight relocation of the station to align it directly with the former railway station—currently operating as a community house—thereby strengthening the visual, functional, and symbolic relationship between heritage, mobility infrastructure, and public space. This adjustment positions the new station precisely between the heritage building and the competition site, establishing a triangular spatial relationship that enables the consolidation of a continuous loop of metropolitan services rather than a series of isolated interventions.

The second decision addresses the spatial configuration of the station itself. The original enclosed layout is transformed by removing the private isolation strip and the metallic fencing, reducing the overall width of the section and prioritizing spatial permeability. Through this operation, the corridor is redefined as a hybrid urban street in which tram operations, vehicular traffic, pedestrian movement, and landscape elements are deliberately integrated at a single level, with only the station platform



Stations Location. | Source: Author's Elaboration

The Train Project Incorporation

The Urban Section

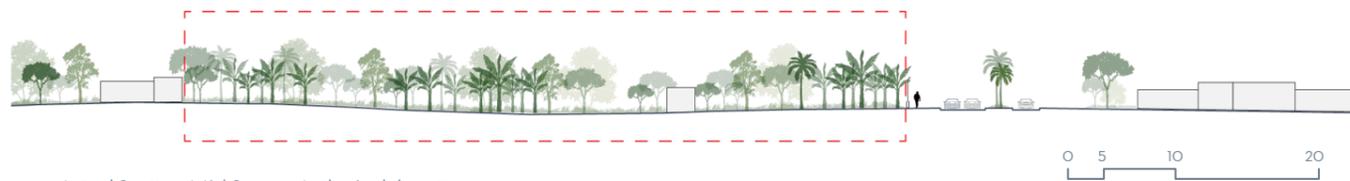
slightly elevated to meet operational and safety requirements.

To achieve this, the proposal reinterprets the existing section—currently classified as a V-2 road with two vehicular lanes and a 2-meter central median—into the following configuration:

- 2 m pedestrian sidewalk (competition site side)
- 3 m green buffer zone
- 3 m single vehicular lane
- 3 m tram track

- 7 m station platform
- 3 m tram track
- 3 m single vehicular lane
- 1.4 m green buffer zone
- 1.2 m pedestrian sidewalk

As a result, the station no longer functions as a physical or visual barrier, but rather as a civic interface that ensures street continuity and consolidates a mixed urban section consistent with Jamundi's scale and urban character.



Actual Section AA'. | Source: Author's elaboration



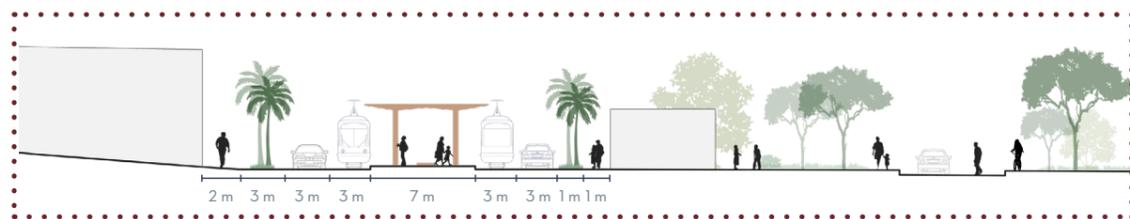
Proposed Section AA'. | Source: Author's elaboration



Actual Section BB'. | Source: Author's elaboration



Proposed Section BB'. | Source: Author's elaboration



Detail Section. | Source: Author's Elaboration



Site Plan with the proposed station | Source: Author's elaboration



Plan of the plot context views. | Source: Author's Elaboration
Plot context images. | Source: Author's Elaboration



03

The Competition's Site

Location Characteristics

The project site is located in the southwestern sector of Jamundí, at the limit between the consolidated urban core and the city's expansion zone. This position defines a strategic transition point where the consolidated fabric meets future residential development.

The area is characterized by low-density housing and emerging urban growth, making it a suitable context for a project that seeks to strengthen the connection between the existing city and its metropolitan mobility network. The site's location along the commuter

train corridor reinforces its potential as an anchor for sustainable urban development at the municipal scale.

At the local scale, the site occupies a strategic position within Jamundí's urban fabric, directly facing the historic railway building and the future commuter train station. This location allows it to function as a bridge between mobility infrastructure and community life, concentrating flows of people and activity. The surrounding area combines residential neighborhoods, schools, sports and recreation

facilities, and the municipal hospital. Key destinations are located within short walking distances: the hospital is approximately an 8-minute walk (or 4-minute drive), the city center about 7 minutes by foot, and several elementary schools within a 5-minute walk. This high level of proximity reinforces the potential of the site to operate as a multimodal and civic hub, supporting both daily mobility and local services.

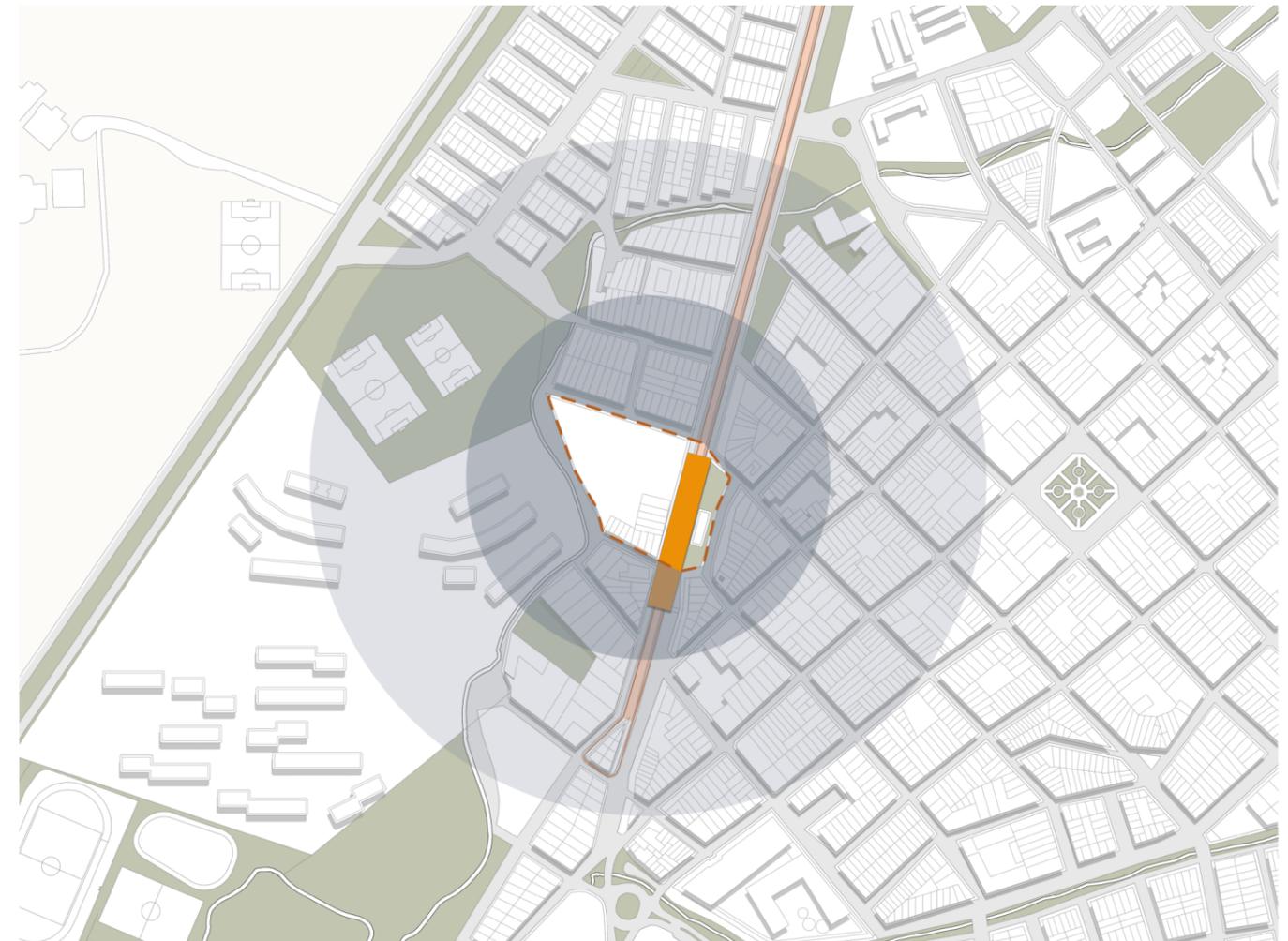
In relation to its immediate context, the western edge of the site borders a large green area that extends toward the urban expansion front, offering an opportunity to link public space, ecological structure, and future residential developments into a continuous and active urban landscape. This condition allows the

project to function as a mediator between the consolidated city and future growth areas, reinforcing environmental continuity at the metropolitan scale.

On its eastern side, along Carrera 14, the site relates directly to the relocated station and the proposed hybrid urban street. The project seeks to establish a clear spatial and functional relationship between three key elements: the former railway station, the new commuter rail station, and the proposed metropolitan facility within the site. Through this articulation, the intervention aims to consolidate a continuous loop of metropolitan services and mobility.



Areas. | Source: Author's Elaboration



Influence. | Source: Author's Elaboration



Heritage Characteristics Within Jamundí

The map illustrates the activity areas into which Jamundí is divided according to its PBOT¹. This classification groups areas of the city that share specific and similar characteristics and, based on these, assigns an urban planning treatment under which specific urban regulations are established.

In the case of the project, it is located within the Heritage Area and is subject to a Conservation urban planning treatment.

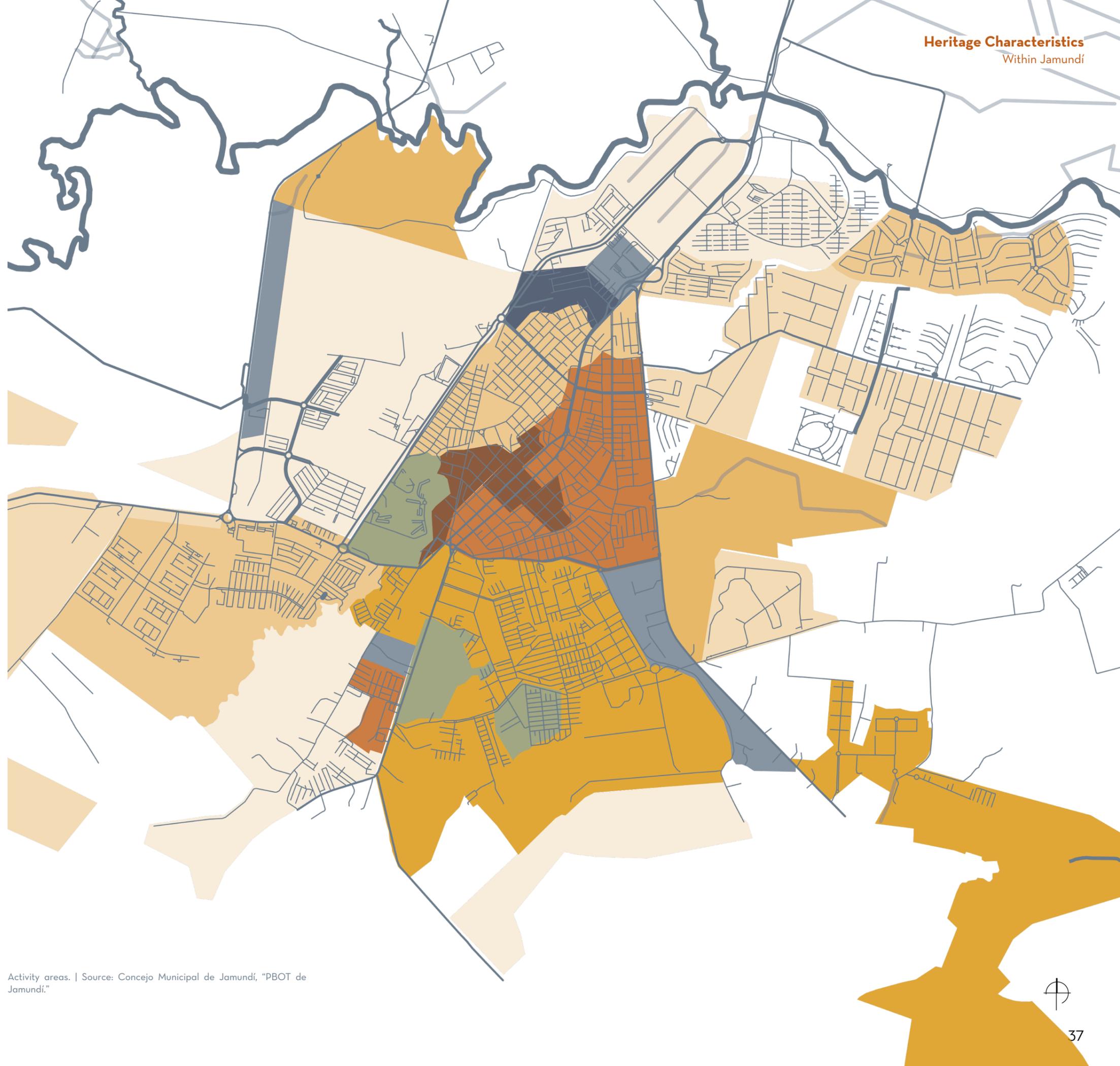
This area is characterized by the presence of buildings and or public spaces that represent historical value, sectors where the urban form is significant, and spaces that are part of the collective memory of the municipality. Its value lies not only in individual buildings, but also in the urban block, the public space, and the relationships between buildings.

It is an area where the traditional urban layout predominates, with compact and dense blocks, pedestrian-scale streets, and a direct relationship between building façades and the street.

Regarding urban regulations, the general guidelines are as follows:

¹ PBOT (Plan Básico de Ordenamiento Territorial): Basic Territorial/Land-Use Planning Plan, the municipal spatial planning instrument in Colombia typically applied to municipalities with 30,000-100,000 inhabitants, establishing land-use, development, and urban management regulations at the local level.

- Residential R0
- Residential R1
- Residential R2
- Residential R3
- Social Housing
- Heritage
- Mixed Use
- Industrial
- Facilities
- Parks and recreation



Activity areas. | Source: Concejo Municipal de Jamundí, "PBOT de Jamundí."



- Conservation takes precedence over replacement.
- Urban and morphological continuity is prioritized.
- New constructions must not overshadow heritage buildings, whether in terms of height, façade treatment, or density.
- Building regulations, such as the site coverage index and floor area ratio, are assessed on a case-by-case basis and do not have fixed values.

Within the PBOT, Urban, Architectural, and Cultural Heritage forms part of the structuring public space system; therefore, the Heritage area is not considered a conventional residential area.

This means that its designated use is not strictly residential, but also allows tertiary uses, such as:

- Facilities and amenities
- Institutional uses and services
- Cultural and community uses

As part of the public space system, projects located within this area are not required to provide mandatory public space land dedications. However, the project must integrate public space in a functional and qualitative manner, through elements such as:

- Accessible courtyards
- Forecourts
- Internal plazas
- Corridors
- Gathering and stay areas

In this context, the requirement is not to grant public space, but to integrate it.

Within Jamundi's heritage framework, several specific properties are officially recognized, including:

1. The Church "Nuestra Señora del Rosario"
2. Culture House
3. The Municipal Mayor's Office
4. The Old Railway Station



Specifically, within the project's area of influence, the former Railway Station is located.

For these properties, regulations establish that the following elements must be protected:

- The structural system
- The spatial layout
- Formal and architectural characteristics,
- Volumetry
- Facades
- Existing uses
- The building's urban function

Total or partial demolition is not permitted, nor are modifications to architectural elements, increases in height, or changes in volume.

In addition to the restoration of buildings, it is permitted and encouraged to interact with heritage assets in the following ways:

- Creating public or semi-public spaces
- That enhance and highlight their value
- Reinforcing visual axes toward the heritage asset
- Orienting ground-floor activities toward it
- Creating plazas, atriums, forecourts, or related courtyards
- Maintaining compatible height and scale

The relationship between heights and volumes is a key consideration in interventions that interact with heritage assets. Ideally, such interventions should:

- not exceed the height of the heritage building;
- maintain an equivalent or smaller scale;
- if additional development is required, locate taller volumes toward the interior of the plot.



Architectural heritage. | Source: Google Earth Pro



The Old Railway Station. | Source: Author's Elaboration



The Church "Nuestra Señora del Rosario". | Source: Google Earth Pro



Architectural heritage. | Source: Author's Elaboration

Constructive Characteristics: Specific requirements and suggestions

The Valle del Cauca region, in which Jamundí is located, has a strong presence of the construction materials industry, particularly in the production of ceramic bricks, clay blocks, cement, and concrete. The region also hosts companies specializing in the treatment and commercialization of guadua (bamboo) for structural and architectural applications, reflecting a growing interest in renewable and low-impact construction systems.

Within Jamundí itself, exposed brick and reinforced concrete are among the most commonly used materials, shaping much of the city's architectural identity. Their durability and low maintenance requirements have made them widely adopted in the humid tropical climate of the Cauca River Valley. However, their high thermal inertia demands careful

control of solar exposure and ventilation, as inappropriate use can contribute to heat accumulation and reduced thermal comfort.

In this context, the competition encourages the exploration of materials and construction techniques that are better adapted to the region's climatic conditions. This includes strategies that enhance natural ventilation, reduce heat gain, manage solar radiation, and incorporate renewable or locally sourced materials. By building upon established construction practices while expanding their scope, the competition promotes proposals that reinterpret local material systems through a contemporary, climate-responsive, and environmentally responsible architectural approach.



Architectural heritage. | Source: Google Earth Pro

Environmental and climatic Characteristics: Within site



Urban and Internal Vegetation. | Source: Author's Elaboration with data from Corporación Autónoma Regional del Valle del Cauca, "Visor Avanzado Geo CVC."

A key contextual condition to highlight is that Colombia is a tropical country located near the equatorial line, which means its climate does not experience drastic seasonal variations as in temperate regions such as Europe. Within this tropical context, Jamundí maintains relatively stable temperatures and solar radiation levels throughout the year, with variations occurring primarily in precipitation patterns rather than in thermal conditions. These climatic characteristics are essential to consider, as they call for design proposals that respond strategically to constant solar

exposure, rainfall management, and thermal comfort through passive architectural and urban strategies.

In addition, the site is directly adjacent, along its western edge, to a drainage channel that forms part of a natural public space system. Due to this condition, current urban regulations require the provision of a 30-meter protection buffer measured from the edge of the water body. Construction is not permitted within this zone; only landscape interventions, ecological restoration, and public space improvements

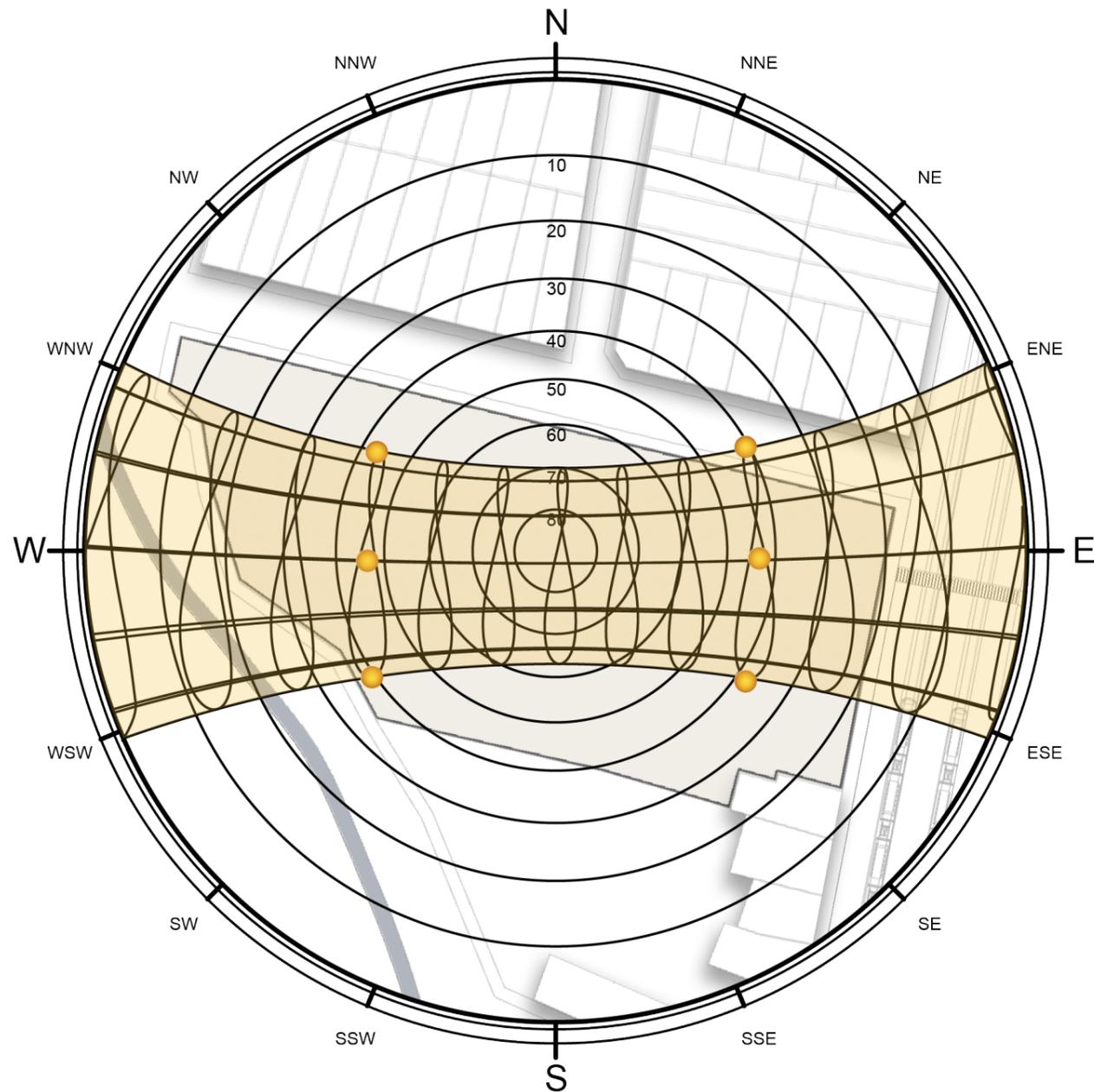
are allowed. This constraint simultaneously represents an opportunity to strengthen environmental continuity, enhance stormwater management, and integrate the project with the city's green infrastructure network.

There are also several trees in the surrounding area, some of which would be affected by the insertion of the new station. Ideally, Trees located outside the plot and affected by the corridor works shall be obligatorily replaced under a 1:1 criterion with an additional 15%

contingency margin.

Tree removal or relocation, inside the plot, may vary according to the design; however, any intervention must be compensated under a minimum 2:1 criterion, privileging species suitable to the local context.

A list of recommended municipal species shall be annexed, recognizing existing palms as part of the vegetal character of the place.



Sunlight path. | Source: Author's Elaboration

Sunlight and Humidity:

Jamundí receives roughly 11 to 12 hours of daylight year round, so solar exposure is constant and often intense. Relative humidity remains high, typically between 80 and 84 percent, which increases the sensation of heat and makes outdoor comfort more demanding throughout the day. The strongest solar loads fall on east and west façades, especially in the morning and late afternoon, so shading and passive cooling measures are not optional but necessary for basic thermal comfort.

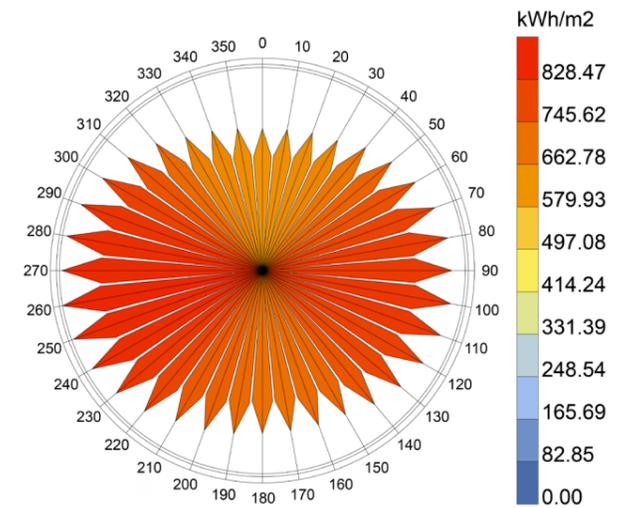
Temperature and Wind:

Temperatures stay warm most of the year. The average annual temperature is close to 22 °C, but daytime conditions commonly reach 28 to 30 °C and the highest heat is usually felt from late morning to mid afternoon, when radiation and humidity combine. Nights are milder, around 18 to 20 °C, which offers a short window for cooling. The warmest period is typically from July to September, with peaks near 31 °C, while the cooler months occur between November and January. Local winds tend to come mainly from the northwest and are more noticeable toward the end of the afternoon, around 5 pm, which can be used to support natural ventilation strategies.

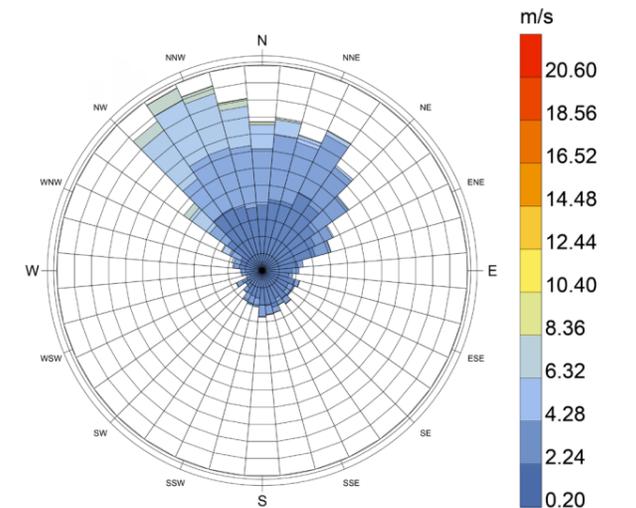
Rainfall:

Rainfall follows a bimodal pattern with two rainy seasons from March to May and from

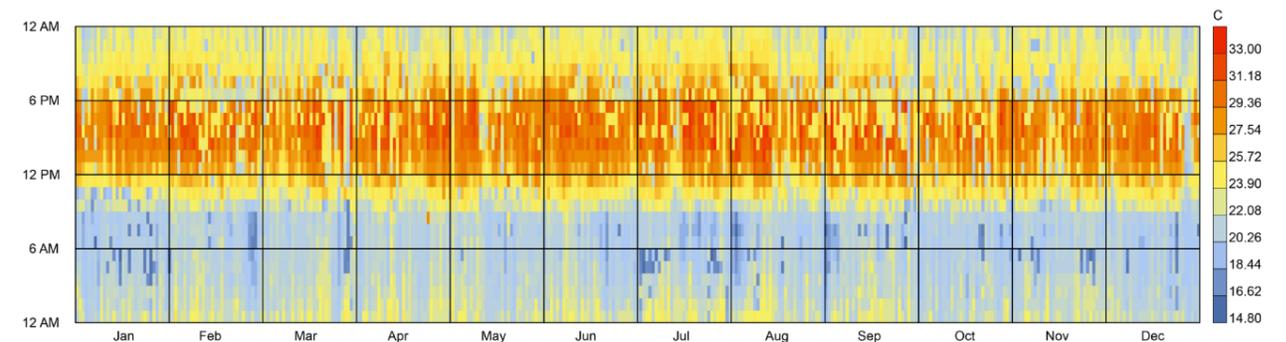
October to November. Drier months usually occur from December to February and from June to August, which reinforces the need to balance shading, ventilation, and water management across contrasting seasonal conditions. February and from June to August.



Radiation during the day in Jamundí. | Source: Author's Elaboration



Compass rose. | Source: Author's Elaboration



Radiation during the year in Jamundí. | Source: Author's Elaboration

04

Constraints, Guidelines and Requirements

Constraints: Mandatory

Site coverage and floor area ratio:

These indices are not strictly fixed by regulation, but are instead defined through analysis of the immediate urban context. Although the surroundings present high levels of site occupation, the project proposes a 50% site coverage in order to improve environmental conditions, favor cross-ventilation, ensure functional courtyards, and promote high-quality open spaces. In coherence with the predominant building heights of the area and the conservation treatment of the heritage zone, a floor area ratio of approximately 0.70 is proposed, allowing a balanced relationship between built volume and open space.

Setbacks:

This sector does not require lateral or frontal setbacks; on the contrary, regulations encourage buildings to be constructed directly along the sidewalk, reinforcing a continuous street profile and the creation of active urban facades.

Public Space Dedication:

Although there is no formal obligation to transfer specific public space areas to the municipality, it is essential that the project incorporate collective spaces that meaningfully interact with their context, such as plazas, courtyards, corridors, or gathering areas.

Building Placement and Heights:

Regulations also establish clear criteria indicating that new constructions must align with existing buildings in both facade and height. Setbacks and additional height are only permitted within the interior of the plot,

ensuring continuity along the street edge while allowing spatial flexibility internally.

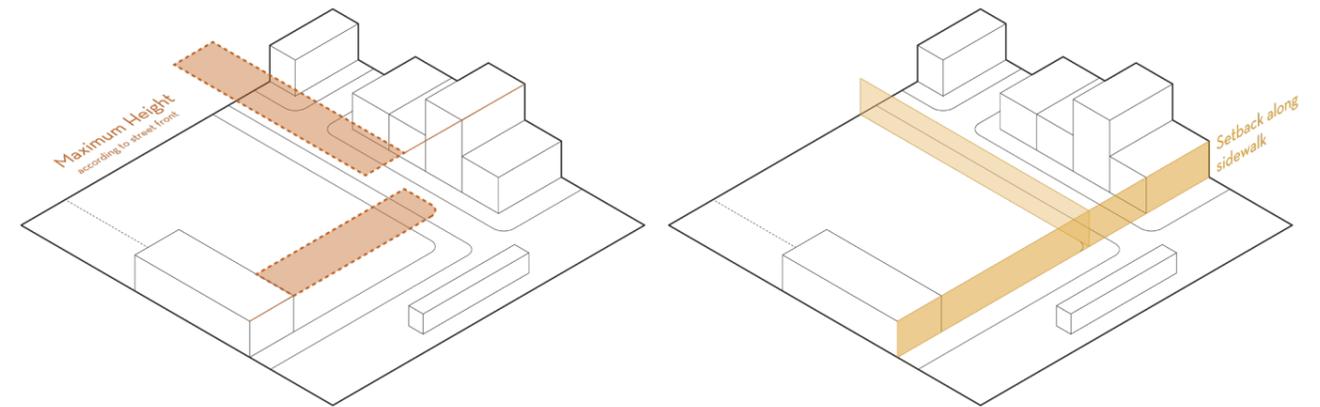
Environmental Protection Strip:

The site is linked to a protected environmental zone associated with the adjacent drainage channel, establishing a mandatory 30-meter buffer in which construction is not permitted and which must acquire ecological and landscape value within the project.

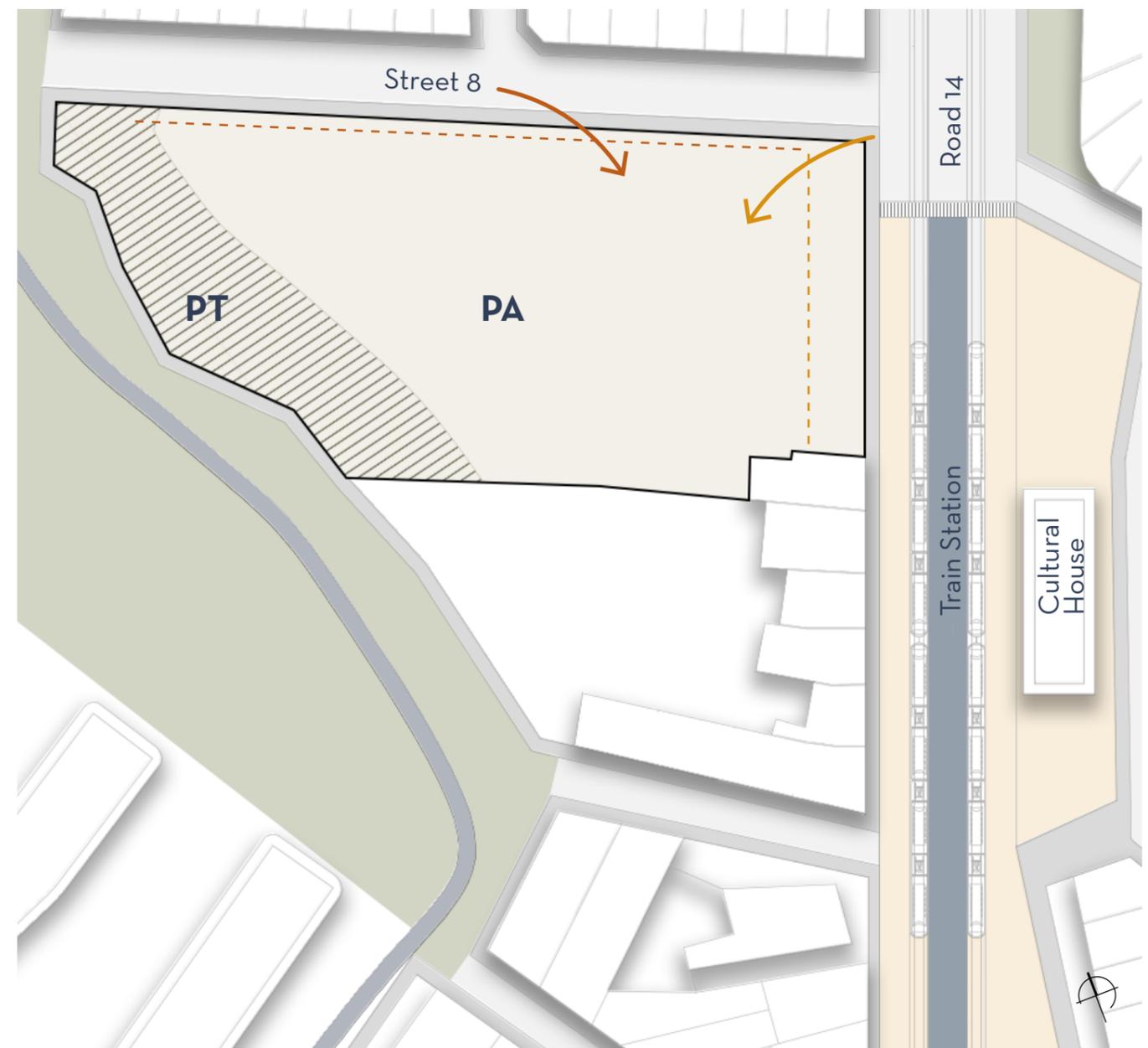
Accessibility and Universal Design:

In accordance with the Colombian Seismic Resistant Code NSR-10, Title J (Accessibility), all proposals must ensure universal access to buildings, public space, and transport interfaces. Circulation systems, entrances, vertical and horizontal connections, and sanitary facilities must be designed to guarantee safe, autonomous, and continuous use by people with reduced mobility, sensory disabilities, and diverse physical conditions. Accessibility is to be understood not as an isolated technical requirement, but as a structuring condition of the project, particularly relevant in a multimodal node that integrates public transport, collective facilities, and public space.

-  (PA) Plot Area: 7984m²
-  (PT) Protection Area: 1703m²
-  P.P. Street:
-  Net Area: 6,281m²
-  Covered area: 3140m²
-  Buildable area: 4396m²
-  Street 8
-  Road 14



Maximum Height and Setback diagram. | Source: Author's Elaboration



Plot areas. | Source: Author's Elaboration

Guidelines and Requirements: Proposed

The design criteria for participants and their specific requirements are described as follows:

Real Multimodal Integration:

The project shall not merely coexist with the new and historic stations, but must be articulated spatially with them, enabling clear flows, universal accessibility, and continuous pedestrian connectivity.

Specific Requirements:

- Ground-floor permeability: the facility must allow pedestrian connections, visual relationships, and constant activation of public space.
- The building shall be crossed in multiple directions: from street to street, from the facility to the station, and from the facility

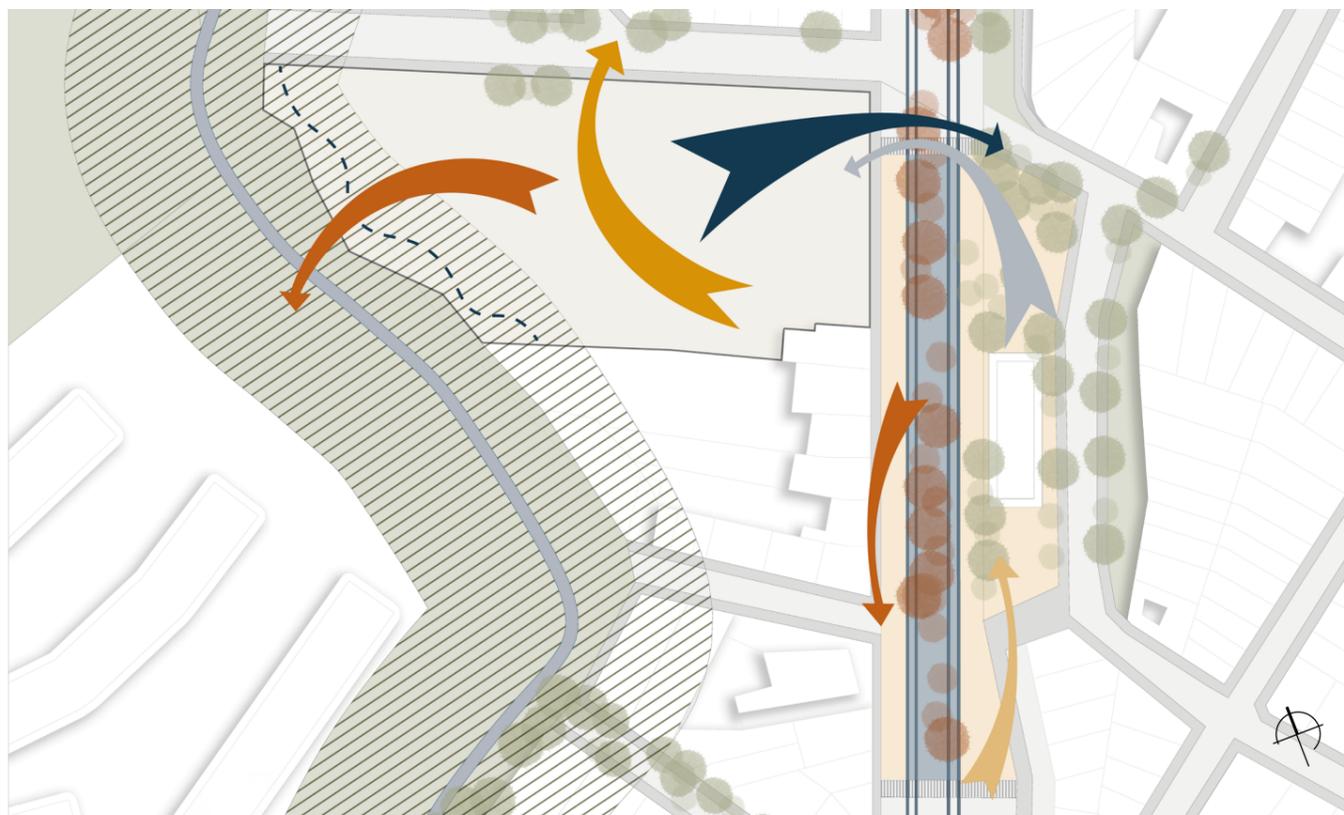
toward the rear environmental protection area.

- Main pedestrian entrance on Carrera 14.
- Vehicular entrance and loading zone on Calle 8.

Living Heritage: The former railway station is not understood as a scenic backdrop, but as a central actor within the system of places.

Specific Requirements:

- Safe pedestrian paths must connect the new facility with the historic station.
- The building shall generate or reinforce visual axes toward the heritage structure.
- The architectural proposal must respect the historic scale of the sector.



*Each arrow indicate the different connections that the project must have with the immediate context

Plot influence flows. | Source: Author's Elaboration

Climate as a Designer: Thermal comfort is fundamental under the tropical condition of the site; therefore, the building and the plot shall be designed to maximize cross-ventilation, shading, low-temperature surfaces, and the provision of vegetation.

Specific Requirements:

- Building orientation shall prioritize protection from east-west solar radiation, placing façades with smaller areas in these directions.
- The implantation shall maximize north-south ventilation corridors, concentrating most openings in those orientations.
- The project must incorporate rainwater retention, infiltration, and controlled conduction strategies (for example: infiltration trenches, rain gardens, and draining surfaces), avoiding concentrated discharges toward the drainage channel.
- Tree removal or relocation may vary according to the design; however, any intervention must be compensated under a minimum 2:1 criterion, privileging species suitable to the local context.
- Trees located outside the plot and affected by corridor works shall be obligatorily replaced under a 1:1 criterion with an additional 15% contingency margin.

Improving the Environmental Protection Area:

More than a limit, this condition becomes an opportunity. The competition requires the integration of this edge as a naturalized park, ecological corridor, and/or extension of public space, strengthening sustainability, thermal comfort, and resilience.

Specific Requirements:

- The area must include an ecological path that allows it to be experienced as natural landscape.
- The ecological path implemented on the opposite side of the channel by the nearby urban development is taken as a reference.
- The proposal shall relate this environmental strip with the facility's programs through

visual connections, courtyards, and gathering spaces.

Urban Safety: Visible, active, illuminated, and appropriable spaces linking design with the prevention of fear in the public realm.

Specific Requirements:

- Public space shall always be proposed in relation to active façades.
- Lighting elements must be placed below the tree canopy.
- Visual transparency and permanent uses on the ground floor are mandatory.

Local Sustainable Construction Technique:

The use of regional materials and sustainable constructive practices is encouraged, favoring identity, local economy, and low environmental footprint.

Specific Requirements:

- Implementation of passive bioclimatic strategies such as perforated walls, lattices, patios, ventilated corridors, and open ground floors in free plan.
- Deep eaves, pergolas, and east-west oriented sunshades.
- Cold roofs through sandwich-type thermoacoustic panels, zenithal ventilation, natural insulation, and high-reflectance surfaces (albedo).
- Optimized use of concrete only where strictly necessary.
- Controlled use of fully glazed facades and heavy metallic enclosures.

Suggestions:

- Use of local materials with low environmental footprint such as guadua and certified timber in some parts of the projects, for example in portico structures, façades, pedestrian bridges, and light roofing systems.
- Use of brick and compressed earth blocks (BTC/CEB) in walls benefiting from its nearby production..

Program

Functions and areas



Urban Analysis. | Source: Author's Elaboration

Based on the land-use and activity analysis, the area is defined by a mix of everyday programs, with a strong presence of local commerce, low-rise housing, elementary schools, and the municipal hospital. The former railway station, currently operating as a small library and cultural facility, will be relocated as part of the site's redevelopment, which reinforces the need to reframe this node as a civic and metropolitan interface.

In response, the new facility is required to incorporate three core programmatic

components. These include higher education learning spaces, a cultural center, and flexible shared offices for co-working and short-term professional use.

The program is conceived as a layered and adaptable system. The combination of local demand and the station's future metropolitan role establishes the mandatory core uses, which are complemented by shared support spaces and a connected network of outdoor public areas that extend the public realm and strengthen daily accessibility.

Urban Demand

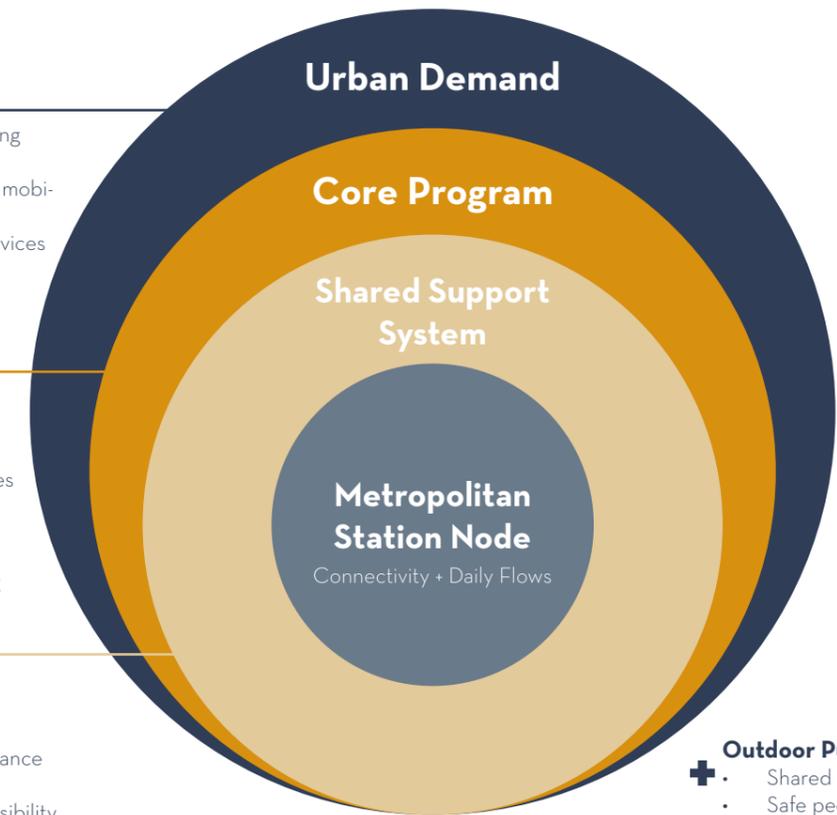
- Education and learning needs
- Employment-related mobility
- Culture and civic services

Core Program

- Culture Center
- High education and learning spaces
- Flexible shared offices

Shared Support System

- Reception
- Administration
- Restrooms
- Storage and maintenance
- Technical rooms
- Circulation and accessibility



Functional Diagram. | Source: Author's Elaboration

Use	Area (m2)	% Per use	Users approx
Education and Learning	1.200	27%	170
Work and productivity	981	23%	120
Cultural and civic center	1.320	30%	160
Shared/Support/Technical	876	20%	-
Total	4.377	100%	450

Program Overview. | Source: Author's Elaboration

Education and Learning:

Planned as 27% of the total project area, or 1,200 m², and with a capacity of approximately 250 users, this function is intended to be a flexible learning hub supporting higher education, tutoring, and community-based training—designed to reduce educational commuting and provide after-school study infrastructure. 30% of the area, or 360 m², is set aside for circulation.

- Flexible classrooms
- Seminar room
- Multimedia / computer room
- Learning commons
- Makerspace
- Professor's rooms
- Storage and circulation

Spatial qualities:

- High adaptability through movable partitions and reconfigurable layouts.
- Natural light provision and proper glare control, for example through the use of shaded edges
- Proper cross ventilation for all spaces
- Acoustic control between classrooms and common spaces
- Clear separation between “quiet” study and “active” making
- Robust finishes for easy maintenance

Work and productivity:

Planned as 23% of the total area, or approximately 981 m², with capacity for roughly 150 users. It is designed to be a work infrastructure for commuters and visiting teams: short-term offices, meeting rooms, and support spaces that allow companies to operate locally without requiring daily travel. 30% of the area, or 300 m², is set aside for circulation.

- Coworking
- Small offices
- Meeting rooms
- Training rooms

- Reception and Lounges
- Printing room
- Lockers
- Storage and circulation

Spatial qualities:

- Mix of privacy levels (open - semi-private - enclosed)
- Excellent acoustics (speech privacy), strong Wi-Fi/IT backbone
- Controlled access (day/night), visibility and safety without feeling “corporate”
- Comfort: shading, air movement, and ergonomic lighting for long stays

Cultural and Civic Center:

Planned as 30% of the total area, or approximately 1,320 m², with a capacity for roughly 200 users. It is intended to be a civic interior that extends the existing cultural role of the historic railway station, offering reading, learning support, and community programming—linked to the new station as a daily public destination. The remaining 30% of the area, 396 m², is set aside for circulation.

- Multipurpose auditorium + basic backstage
- Rehearsal room
- Exhibition room
- Memory archive
- Local knowledge workshop
- Foyer
- Coordination office
- Storage and circulation

Spatial qualities:

- Define clear learning gradients with active, focused, and quiet zones and prevent acoustic spillover between the commons, classrooms, and makerspace.
- Provide long-stay comfort with glare-controlled daylight, stable thermal conditions, and a calm visual environment that supports concentration.
- Strong relationship to public space (front plaza, shaded outdoor reading)

Use	Space	#	Users	m2 per User	Total Area
Educational	Flexible classrooms	5	25 c/u	2.02	252.00
Educational	Seminar room	1	18	2.50	45.00
Educational	Multimedia Room	1	30	3.67	110.00
Educational	Learning commons	1	90	2.22	200.00
Educational	Makerspace	1	30	5.00	150.00
Educational	Professor's Rooms	1	15	3.00	45.00
Educational	Storage	-	-	-	38.00
Educational	Circulation	-	-	-	360.00
	Total				1.200 m2
Work/Prod	Co-working	1	86	3.50	301.00
Work/Prod	Small Office	6	8	2	96
Work/Prod	Meeting Room	2	10 c/u	2.87	57.34
Work/Prod	Traning Room	1	25	2.87	71.677
Work/Prod	Reception	1	-	-	29.86
Work/Prod	Printing Room	1	-	-	23.89
Work/Prod	Lounges	1	20	3.58	71.67
Work/Prod	Lockers	-	-	-	17.92
Work/Prod	Storage	-	-	-	11.95
Work/Prod	Circulation	-	-	-	300.00
	Total				981 m2
Cultural	Auditorium	1	150	1.36	203.28
Cultural	Basic Backstage	1	-	-	27.72
Cultural	Rehearsal Room	1	25	2.96	74.00
Cultural	Exhibition Room	2	100	2.22	221.76
Cultural	Memory Archive	-	-	-	55.44
Cultural	Local Workshop	3	75	2.59	194.04
Cultural	Coordination Area	1	-	-	18.48
Cultural	Storage	-	-	-	36.88

Use	Space	#	Users	m2 per User	Total Area
Cultural	Circulation	-	-	-	396.00
	Total				1.320 m2
Technical	Lobby	-	60	1.74	104.34
Technical	Coffe Shop	-	90	1.74	156.51
Technical	Restrooms	-	-	-	78.26
Technical	Administration Office	-	8	-	69.56
Technical	Security Office	-	2	-	17.39
Technical	General Storage	-	-	-	52.17
Technical	Technical Rooms	-	-	-	104.34
Technical	Garbage Rooms	-	-	-	17.39
Technical	Cleaning Rooms	-	-	-	13.04
Technical	Circulation	-	-	-	263.00
	Total				876.00 m2
				Total	4.377 m2

The areas indicated in this architectural program are referential in nature and serve as a guideline for the development of the project. Participants may propose adjustments, reinterpretations, or include additional uses they consider relevant, provided these are properly justified and do not exceed the maximum permitted total buildable area.

Urban Trees & Species

Guidance for the Jamundí Multimodal Hub

This annex is intended to support contestants in making more informed landscaping decisions, both within the project site and in the surrounding context (the new station and the Cultural House). It compiles the plant species most suitable for Jamundí and provides practical guidance on where and how to use them, according to the characteristics of each space and the specific requirements of each species.

The recommendations are based on the Jamundí Tree Census prepared by CVC and CITCE (2022). According to this study, the urban core contains 26,854 living trees, representing 70 botanical families and approximately 355 species. Beyond simply documenting tree numbers, the census was developed as a tool to improve environmental conditions in the region, supporting the restoration of ecological balance and the creation of healthier urban and rural environments for everyday life.

Several issues identified in the report are particularly relevant to this thesis and have been translated here into clear design guidelines. In practice, these issues inform how vegetation should be integrated into the proposal—not as a decorative element, but as a component of the project’s environmental performance and long-term maintenance strategy.

First, the census reveals a highly uniform landscape, in which a limited group of species dominates the territory. This condition can reduce ecological resilience; therefore, proposals should avoid dependence on a single species and instead adopt a more diverse planting strategy that incorporates multiple suitable options. Second, the study identifies a significant canopy deficit, as only 3.3% of the surveyed trees have crown diameters greater than 10 meters. Where spatial conditions allow, increasing the presence of large-canopy trees can substantially improve shade, thermal comfort, and overall urban environmental quality.

The census also highlights several practical constraints. A considerable number of trees –5,832 individuals – are already in contact with overhead utility lines, making species selection

and placement especially critical along streets and rail-adjacent edges. In addition, the report identifies risk factors related to fruit drop and aggressive root systems, which can damage infrastructure or pose risks to pedestrians. These conditions underscore the importance of careful species-site matching, as well as the application of clear setback rules in high-traffic areas.

Finally, the census notes a strong presence of introduced species compared to native ones. For this reason, proposals are encouraged to prioritize native species whenever possible, strengthening local ecosystems and contributing long-term environmental value to the project.

Drawing on the issues identified in the report and the list of species recorded in Jamundí, this annex proposes a concise classification as a practical guide for plant selection. The intention is not to restrict design approaches, but to support clearer decision-making by linking each species to the role it can best fulfill within the project and to the specific conditions of each space. For this reason, the selected species are grouped into four categories:

Strong Native Trees		Provide shade and help shape the main outdoor spaces.
Image	Name	Characteristics and Recommendations
	Samán Samanea saman	Iconic large canopy. Requires generous soil volume. Best located in main plazas and large lawns.
	Piñón de Oreja Enterolobium cyclocarpum	Big crown spread. Best located in major civic greens and ecological buffers.
	Ceiba Ceiba pentandra	Landmark tree. Due to its big roots, it must be placed in large open areas.
	Guácimo Guazuma ulmifolia	Native tree. Medium shade. Best located in secondary corridors and transitions.
	Ébano Falso Geoffroea spinosa	Native tree. Robust structure. Best located in suitable for wider streets and civic greens.

Seasonal-flowering		
Support the project's image at different times of the year.		
Image	Name	Characteristics and Recommendations
	Guayacán Rosado <i>Tabebuia rosea</i>	Best located in the station forecourt and cultural frontage.
	Guayacán Amarillo <i>Handroanthus chrysanthus</i>	Native tree. High-visibility. Best located in highlighting promenades and pedestrian routes.
	Gualanday <i>Jacaranda caucana</i>	Native tree. Delicate foliage and violet blooms. Best located in a medium width streets.
	Senna <i>Senna spectabilis</i>	Rapid growth and bright flowering. Requires planned maintenance due to leaf/flower litter. Best located in secondary areas

Productive gardens		
Only for areas where maintenance and management are planned.		
Image	Name	Characteristics and Recommendations
	Mango <i>Mangifera indica</i>	Introduced tree. Provides good shade. Requires strict fruit-drop management. Use only in softscape areas.

	Aguacate <i>Persea americana</i>	Native tree. Ideal for educational gardens or “urban orchards.”
	Guanabana <i>Annona muricata</i>	Native tree. Small to medium scale. Best located in sheltered garden areas.

Palms		
As a local character layer, meant to complement, but not replace, shade trees.		
Image	Name	Characteristics and Recommendations
	Palma Zancona <i>Syagrus sancona</i>	Iconic large canopy. Requires generous soil volume. Best located in main plazas and large lawns.
	Palma de Cera <i>Ceroxylon quindiuense</i>	Big crown spread. Best located in major civic greens and ecological buffers.
	Palma Areca <i>Adonidia merrillii</i>	Landmark tree. Due to its big roots, it must be placed in large open areas.

All images in the tables are from **Plants of the World Online (POWO)**, Royal Botanic Gardens, Kew, <https://powo.science.kew.org/> and **Catalog of Flora Valle de Aburrá**, <https://catalogofloravalleaburra.eia.edu.co/>

Survey

Professional Review of the Call for Architects Brief

This annex compiles the questions and responses obtained through a qualitative survey conducted with five architects. The aim of this exercise was to evaluate the clarity, coherence, and overall quality of the competition brief, as well as its effectiveness in communicating the project's objectives, scope, and expected outcomes.

The selected participants include architects with different levels of familiarity with the municipality of Jamundí. This diversity allowed the brief to be assessed both from an external perspective—representative of potential competitors unfamiliar with the local context—and from an informed local viewpoint. Their feedback provides a critical and complementary reading of the competition bases, identifying strengths, ambiguities, and opportunities for improvement.

The observations gathered in this annex serve as a validation tool for the brief as a methodological instrument and contribute to the reflection on its capacity to bridge academic research and professional practice in the formulation of urban and architectural competitions.

Survey Questions

Author

1. Understanding of the assignment

- If you were a competitor in this call, do you feel that the brief clearly explains what is expected from the project (objectives, scope, and type of proposal)? Is there anything that generates confusion or ambiguity?

2. Context and available information

- Do you consider the contextual information provided (site, problem statement, theoretical framework, constraints, etc.) to be sufficient and relevant to address the project? Would you add or remove anything?

3. Overall quality of the brief

- In general terms, do you consider this to be a well-structured and stimulating competition brief? Would it motivate you to participate? Why or why not?



Survey Answers

Interviewees

Howard L. Cruz (Not familiar with Jamundí)

1. Understanding of the assignment

“From the perspective of a potential competitor, the brief is sufficiently clear and concise, not only in the definition of the project’s general objectives but also in the scope of the assignment and the type of proposal expected. The text allows for a precise understanding that the central purpose of the competition is to address Jamundí’s regional mobility challenges through the design of a multimodal transport facility—understood not merely as physical infrastructure, but as an articulating node between the municipality and the metropolitan system associated with Cali and its surrounding municipalities.

The document consistently explains the relationship between current mobility deficiencies, accelerated urban growth, and the need for a structural solution, which adequately guides the competitor in terms of design intent and strategic approach. No significant ambiguities are perceived regarding what is expected from the project.

As a possible improvement, the brief could further specify the expected level of definition of the proposal (for example, whether the emphasis should be conceptual, urban-architectural, or technical). However, this omission does not generate confusion; rather, it leaves a reasonable margin for design exploration, which is common and often desirable in academic and professional competitions.”

2. Context and available information

“The urban contextual information provided is sufficient and relevant to approach the project in a well-founded manner. The brief adequately describes the site, the mobility problem, Jamundí’s relationship with the metropolitan

area of Cali, and the urban constraints that influence the proposal. Likewise, the theoretical framework related to multimodal mobility and transport facilities offers a clear conceptual basis to support design decisions.”

3. Overall quality of the brief

“Overall, the brief is perceived as a well-structured and coherent document. The issue addressed is both real and current, operating at urban and regional scales, which increases the relevance of the assignment and gives it clear academic and professional value. The clarity with which the role of the multimodal facility is presented makes the competition an attractive design challenge.

As a competitor, participation would indeed be motivating, mainly because the assignment goes beyond an isolated architectural object and proposes an integrated reflection on mobility, territory, and urban articulation. Furthermore, the brief successfully balances problem definition with design freedom, encouraging innovative proposals without losing technical rigor or urban relevance.

From a methodological standpoint, this exercise demonstrates how a preliminary brief can function as an effective tool to address complex urban issues such as regional mobility and territorial integration. Its open and initial nature is not a weakness, but rather a condition that fosters design exploration and the development of multiple intervention scenarios. These preliminary bases could later be refined and validated in a second phase of technical, regulatory, and institutional development, serving as a bridge between academic research and professional practice.”

Isabella Montero (Familiar with Jamundí)

1. Understanding of the assignment

“From my background as an architect trained in Cali, the brief is presented as a clear document in terms of objectives, project scope, and the type of intervention expected. The multimodal nature of the facility and its articulation with the commuter rail system are clearly understood, allowing the assignment to be approached from an integrated urban perspective.”

The project is particularly relevant in recognizing Jamundí’s current role as a strategic node within the metropolitan system, where a large portion of the population resides and commutes daily to Cali for work and educational purposes.”

2. Context and available information

“The contextual information is broad and adequate for understanding the territorial dynamics of the southern Valle del Cauca region. The analysis of urban growth, the functional relationship between Jamundí and Cali, and the mobility and access-to-services challenges accurately reflect real territorial conditions.”

In addition, the emphasis on tropical climate, heritage, and environmental conditions provides relevant criteria for developing architectural proposals that are sensitive to the local context and aligned with sustainability principles.”

3. Overall quality of the brief

“In general terms, the brief is well structured and proposes an assignment that is relevant from both an academic and an urban perspective. The integration of mobility, public space, and facilities allows for addressing current challenges at the metropolitan scale.”

This type of initiative has a high potential impact, as it strengthens local service provision in Jamundí, improves its functional relationship

with Cali, and contributes to a more balanced and sustainable territorial development.”

Catalina Cadena (Not familiar with Jamundí)

1. Understanding of the assignment

“The brief clearly conveys its strategic purpose: to move away from the idea of an isolated building and instead propose a node that articulates Jamundí with the region through the commuter rail system. The objective of achieving “functional balance” in order to reduce dependence on Cali is particularly strong.”

However, there is some ambiguity in the programmatic definition. By requesting uses of “metropolitan scale” (such as education, culture, and coworking) without a reference area schedule, the overall magnitude of the intervention remains open. As a participant, this would raise the question of whether the intention is a large architectural landmark or a more distributed and permeable urban intervention. While this level of freedom is interesting for a thesis, it can be demanding in the context of a fast-paced competition..”

2. Context and available information

“The territorial reading is accurate. The diagnosis of residential expansion disconnected from services and employment opportunities precisely describes Jamundí’s current reality.”

From my experience, I would add two technical layers to strengthen the proposal:

Immediate road connectivity: Although the rail system is the main axis, the project should address how it connects to an existing road network that currently experiences congestion (Cañasgordas / Panamericana).

Environmental constraints: More detailed

information regarding flood risks or groundwater levels would be useful, given that this is an expansion area over former agricultural land and wetlands, an aspect that is critical for technical feasibility in this context.”

3. Overall quality of the brief

“This is a solid and highly stimulating proposal. The topic is relevant because it addresses the most important urban discussion currently taking place in the Valle del Cauca: metropolitanization.”

I would definitely participate. This is not the typical abstract exercise of designing “a museum” or “a library”; it is a challenge that combines architecture and infrastructure. It invites responses to real mobility and spatial segregation problems experienced on a daily basis, which gives the competition a strong sense of urgency and social relevance, particularly appealing for young architects.”

Valeria Zúñiga (Familiar with Jamundí)

1. Understanding of the assignment

“I feel that the main objective should be stated at the beginning of the document. Because the brief moves from a macro to a micro scale, during the first reading it is not immediately clear what my specific “assignment” is. The overall purpose is understandable, but the concrete task only becomes clear toward the end. Aside from this aspect, the brief is clear.”

2. Context and available information

“All of the contextual information seems appropriate.”

3. Overall quality of the brief

“Yes. Perhaps incentives are missing, but I understand that this falls outside the scope of a thesis-based competition.”

Juan E. García (Familiar with Jamundí)

1. Understanding of the assignment

“Yes, the brief is clear. The only observation is that some of the maps lack the names of important streets or contextual buildings, which would help those unfamiliar with the city better understand the site.”

2. Context and available information

“The information presented is relevant. In fact, there may even be more information than necessary, although this perception likely stems from my familiarity with the place. I also believe it would be beneficial to include more graphic references in the requirements section.”

3. Overall quality of the brief

“Yes, I find the competition proposal very interesting. The choice of the problem and the site is well considered, and the competition offers many opportunities, which makes it particularly appealing.”