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Urban Strategies Towards Sustainability. Exchanging knowledge between Global South and North: insights from an interdisciplinary workshop in Nayón, Quito (Ecuador)

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Abstract

There is an imminent relation between transport, sustainable urban planning and the global ecological crisis. Additionally, an academic trend can be observed towards the decolonisation of knowledge. Within this context, work remains regarding the praxis of knowledge from the Global South, especially regarding transport. This article addresses the gap by drawing on results of an interdisciplinary workshop that centred on transport, was held in a university of the Global South, and included students from the Global North. First, an overview of Ecuador and the rights of Mother Earth is given. Second, transport in the capital city, Quito, is summarised. Third, the parish of Nayón in the suburbs is described, which was the intervention area for the workshop. The design and results of the workshop are described, whereby the conclusions related to the objective of this study are drawn. Whilst no claim can be made to have solved the problem of decolonisation and the global ecological crisis, a meaningful step forward was made. This highlights the importance of education and collaborative knowledge creation between the Global South and North for advancing sustainable transport within planetary boundaries.

Keywords: Ecological transition, Mobility, Integrated Design, Decolonization, Community Engagement

1. Introduction

The article explores how the sustainability crisis might be addressed through education, design, transport and the decolonisation of knowledge, using the case study of a collaborative design workshop carried out in the Nayón parish of the city of Quito, Ecuador. In October 2016, Quito was placed at the forefront of the international debate on how to achieve SDG n. 11 (Sustainable Cities and Communities) of the United Nations Agenda 2030, adopted one year earlier, by hosting Habitat III (HIII), the World Summit on Housing and Sustainable Urban Development. Although the conference did not gain much international resonance, its final Quito Declaration on Sustainable Urban Settlements, also known as New Urban Agenda, set the stage for a paradigm shift in human settlements (Keith et al., 2023) "based on the integrated and indivisible dimensions of sustainable development: social, economic and environmental" (UN-Habitat, 2016, p. 11) to be pursued through people-centered, integrated and multi-level plans and policies. Despite its call for approaches tailored to local contexts, the document draws for its implementation on the International Guidelines on Urban and Territorial Planning, which were adopted the previous year by the Governing Council of UN-Habitat as a "universally applicable reference framework to guide urban policy reform" (UN-Habitat, 2015, p. 1). These promote "more compact, socially inclusive, better integrated and connected cities and territories that foster sustainable urban development and are resilient to climate change" (UN-Habitat, 2015, p. 1), with implicit but clear reference to good practices coming from the Global North: a model that is difficult to replicate in Global South countries without dissociating the principles of compactness and accessibility of urban districts from the goals of social inclusion and equal transition.

The urban planning and infrastructure decisions made in the metropolitan area of Quito after Habitat III reflect this dissociation. They were based on the principles of the Compact City and aligned with the concept of Transit-Oriented Development (TOD), that promotes mixed-use, high-density urban areas located near public transport stations (Calthorpe, 1993; Suzuki et al., 2013). Questioning the possibility of adopting "universally applicable" approaches to urban sustainability, the following sections of this paper will focus in particular on the issue of urban transport, seen as a lens to target the three dimensions of sustainability (environmental, social and economic) and as a possible lever towards more sustainable and resilient settlement models, referring to the case study of Quito (where the impacts of car mobility are exceptionally high, despite a relatively low motorization rate). The topic will be discussed in three sections:

- First, the theoretical framework for the article is set out. The immanent relation between mobility and sustainability are made clear. Additionally, the necessity to work through the perspective of the Global South within the context of decolonising transport knowledge is introduced.
- Second, the article familiarises the reader with Ecuador (and the rights bestowed on Mother Earth), before moving to the capital city of Quito (with a particular focus on its transport infrastructure) and ultimately at the level of the Nayón parish (the intervention location where the workshop was based).
- Third, the workshop and its results are then described in detail. Finally, conclusions are drawn with respect to how common challenges in coping with global crises require narratives and approaches that arise from collaborations between the Global South and North.

2. The paradoxes of sustainable urban mobility in the countries of global south and the need to decolonise transport knowledge

Urban mobility plays a decisive role in influencing sustainability, both locally and globally, considering:

- the 'weight of cities' (Swilling et al., 2018), and especially the effects of urbanization in Global South countries on the overall balance of our planet. The figures are well known: the urban population rate is projected to reach 66% out of 9.2 billion people by 2050, compared to 36% out of 3.7 billion in 1970 and 46.5% out of 6.1 billion in 2000.
- most passenger and freight travel is generated by or takes place within cities.
- the transport sector as a whole is responsible for 23% of total CO_2 emissions from fuel combustion, of which road transport accounts for the largest share (20%) (Statista, 2024).
- at 52% of the total energy consumption, the relative energy demands of the transport sector for countries in the Global South such as Ecuador is much greater than for countries located in the Northern and Southern hemispheres, due to the lack of demands for heating and cooling (MEM, 2023).

Mobility has a significant impact on all dimensions of sustainable development and is probably the issue that mostly creates possible ground for conflict between them in urban and metropolitan contexts (Table 1). Symmetrically, its shift towards sustainable practices, to drastically reduce its contribution to greenhouse gas production, is widely recognized as a powerful lever to make cities more sustainable and resilient to climate change (MIMS, 2022).

Economic	**Social**	**Environmental**
Traffic congestion	Inequity of impacts	Air pollution
Mobility barriers	Mobility disadvantaged	Climate change
Crash damages	Human health impacts	Habitat loss
Transportation facility costs	Community cohesion	Water pollution
Consumer transportation costs	Community livability	Hydrologic impacts
Depletion of non-renewable resources	Aesthetics	Noise pollution

Table 1 - Transportation Impacts on Sustainability (VTPI, 2017)

While sustainable mobility is not directly included as a specific Sustainable Development Goal in the UN Agenda 2030, “affordable and sustainable transport systems” is set as target #2 (just after “affordable housing”) of the aforementioned SDG 11 (UN, 2015). More broadly, the role of transport is implied in the achievement of most of the 17 SDGs and is directly or indirectly mainstreamed in 12 targets of 8 SDGs, as highlighted by the High-Level Political Forum on Sustainable Development (HLPF), the central UN platform for the follow-up of the Agenda (SLOCAT, 2018).

From an economic perspective, the growth curves of per capita income and individual travel (measured in person-kilometres per year) in both wealthy and developing countries demonstrate that mobility is simultaneously a driver and an outcome of development (WBCSD, 2004). This increase is also reflected, although not in direct proportion and in different ways in different regions of the world, in the rate of private motorization. This explains why, according to Enrique Peñalosa[1] (as cited in Suzuki et al., 2013, p. xxii) “transport differs from other problems developing societies face, because it gets worse rather than better with economic development. While sanitation, education, and other challenges improve with economic growth, transport gets worse.”

Among the South American countries, Ecuador has one of the lowest motorization rates - 160 motor vehicles per 1000 inhabitants compared to the average of 260 - with an annual growth rate (calculated over the period 2015-2020) of 3% (SLOCAT, 2021). This results in an increase in transport CO_2 that, according to the Transport and Climate Change Global Status Report 2021 by SLOCAT (Partnership for Sustainable Low Carbon Transport), exceeds the country's economic growth. However, it should be borne in mind that, despite the upward trend, these percentages of circulating vehicles in relation to the population are well below the averages recorded in Global North countries: around 850 vehicles per 1.000 inhabitants in the USA (World Population Review, 2025), 560 in the EU, with peaks of almost 700 in Italy, Luxembourg and Finland (Eurostat, 2024).

The challenge of sustainable mobility is therefore different in wealthier countries and in emerging economies: while in the former the primary objective is to reduce ‘car dependency’ (OECD, 2021) by offering a modal mix that is less impactful overall, in the latter it is first necessary to prevent the rise of car dependency by providing universal access to alternative modes of transport, taking into account the spatial and social morphology as well as the growth processes of cities.

Contextualizing transport policy is a principle that should be applied everywhere if the goal is to move beyond the homogenizing, car-centric model that has proven unsustainable. This means de-sectorizing related knowledge in favor of holistic, place-based approaches where technical issues and potential solutions are aligned with local problems and opportunities of various kinds, while integrating economic, environmental, and social concerns (Alberti, 2014).

Additionally, this requirement is accompanied by a move to decolonise western paradigms and knowledge, which can be extended to the transport sector. In his recent work, Mignolo (2021) sees the decolonial movement in the 21st century as the potential end of a history that began in the 1500s and has defined ontology up until present through colonial thought. He highlights how geopolitical specific contexts define contours of thought and modes of agency. Quijano (2024) pushes for the lens through which the world is interpreted to be placed firmly in the hands of the Global South. In the context of Latin America he challenges that the hegemony of knowledge and a ‘correct’ form of thinking has been imposed from a eurocentric vision of the world, defined by Western concepts surrounding race, global capitalism and modernity. In their work on decoloniality, Mignolo and Walsh (2018) push further and go deeper, calling for a change in core ontological beliefs over and beyond a mere transfer of sovereignty. They insist on praxis,

[1] Former Mayor of Bogota and former President of the Board of Directors of the Institute for Transportation and Development Policy (ITDP), New York.

whereby theory is put into practise through decolonial movements and activities. Quijano (2024) suggests a framework whereby this might be done, with several different manners through which to interpret the world coexist, but where they find sufficient common ground. Escobar (2018) proposes the practice of design to be a plausible common ground, which he argues should incorporate plural ontologies that challenge the capitalist modernity that is associated with colonial thought.

There is no blueprint for the decolonisation of transport knowledge in particular (Schwanen, 2018) and it could be considered a "challenge without an end" (De Leeuw and Hunt, 2018, p. 10). Schwanen (2018) points out the transport sector often focuses on ensuring faster and more reliable circulation of vehicles and people (whilst minimising negative externalities). He highlights the reliance on modes of thinking that include engineering and economics, coupled with quantification and econometric modelling undergirded by traditional notions of scientific objectivity, where one of the results is universality becoming privileged over particularity. In this context, Wood, Kębłowski and Tuvikene (2020) put forward that three interrelated, counter-hegemonic shifts are needed in decolonisation and the creation of academic knowledge about transport, moving beyond:

- the dominance of knowledge producing centres of the Global North towards including the Global South (a geographical shift);
- techno-centric oriented transport studies (an epistemological shift), and;
- the idea of solely formal systems of transport (an empirical shift).

From this premise they argue we should "not simply explore transport *in* the South… but also *from* the point of view of the South" (p. 2). We, as authors, take the stance that a convergence of knowledge produced *between* the Global North and South is beneficial. The article strives to make a step in the right direction by reflecting on the results of a collaborative design workshop.

3. The context explored

3.1 Ecuador, steps forward and backwards in defending the rights of Mother Earth

Among the 17 megadiverse countries recognized by the World Conservation Monitoring Center of the United Nations (UNEP-WCMC), Ecuador has the highest concentration of biodiversity per square kilometer (CI, 2023) – in other words, it is "the most biologically diverse country in the world" (GFN, 2015). It is also the first state to have formally included the rights of Mother Earth (*Pachamama*) in its constitution, approved in 2008, establishing the pursuit of well-being (*el buen vivir*) in harmony with nature as a fundamental objective of society. In line with this, a 2009 presidential decree promoted the use of ecological indicators like the Ecological Footprint to guide long-term policy (GFN, 2015). The initiative arose from the awareness of an ongoing process of depletion of natural resources due to the country's development model based on capitalist principles, characterized by the production and commercialization of primary products such as cocoa, bananas and oil.

Moreover, exporting biocapacity to deficit nations was established as a national strategic objective. However, despite official commitments, the gap between biocapacity and the Ecological Footprint, that was equal to 1,4 gha in 1961, has continued to narrow, halving from 0,4 gha in 2009 to 0,2 gha in 2019.

Once the possibility of 'selling' biodiversity to third countries had extinguished, Ecuador instead found itself paying very high costs in dealing with the damage caused by global warming to its territory. In 2023, a severe drought reduced the generating capacity of hydroelectric power plants, which provide most of the country's energy production, causing a major energy crisis that lasted until December 2024 (Watts, 2024). This was followed in February 2025 by heavy rainfall in 23 out of 24 provinces, which caused landslides, floods, and damage to infrastructure, affecting over 90,000 people (DG ECHO, 2025).

More broadly, the Ecuadorian Andes have lost about 50% of their glaciers since the mid-1950s (MAE, 2019), while in the Amazon, deforestation for agriculture, cattle ranching, and mining destroys at least 80,000 hectares of forest per year, resulting in a significant loss of biodiversity -estimated at 50,000 species annually (Abata, 2018). And although in August 2023, in a historic referendum, 58.6% of Ecuadorians voted to block drilling in the Yasuní National Park, which covers more than 980,000 hectares in the country's Amazon region, the government has asked for an extension until December 2029 to dismantle the 227 wells there, five years longer than the deadline set by the Constitutional Court. A clear sign of the resistance of the political-industrial bloc to implement the constitutional principles that the country has established for itself.

3.2 Quito as a testing ground for sustainable city concepts

Ecuador's capital is also an emblematic case of the challenges and contradictions of the concepts of sustainable development when applied to the regions of Global South.

Located at 2,850 meters above sea level on a plateau surrounded by volcanoes, Quito is the second-highest capital city in the world, after La Paz in Bolivia. The uniqueness of the natural setting is here coupled with the high cultural value of the historical urban core, dating back to the Spanish colonial period (16th century), which accounts for another record that the city can claim: its center was the first World Heritage Site listed by UNESCO in 1978. The old town, including its 19th and early 20th century additions, is dominated by the hill of Panecillo, which rises 300 meters above the plateau and on which a 45-metre-high statue of the Virgin Mary was erected in 1979, becoming the symbol of the city.

In the early 1940s, the *Plan Regulador* (1942-45) by Uruguayan architect Jones Odriozola, oriented the development of the city with a zoning system based on the four key functions of the Athens Charter (1935) - housing, work, leisure, and transportation. This shaped the city's spatial and social structure by locating government offices, commerce, low-income housing, and hospitals in the center; the university and residential areas for employees and the affluent in the north; and industrial zones along with middle- and lower-class housing in the south (Aguilar 2014; Salazar Veloz & Becerra Martínez, 2023).

Since then, the continuous growth of Quito (from just under 200,000 inhabitants in 1940 to about 1.9 million today), along with the even more rapid expansion of Ecuador's main port city, Guayaquil (from 200.000 in 1940 to 3.3 million) reflects the aforementioned liberalist development process. As in other Global South countries (Guerrero, 2015), this led to massive inland migration, concentrating 64% of the national population in urban areas, more than half (34%) in the two main centers (INEC, 2022). The metropolitan area of Quito now presents itself as an urbanized continuum 40 km long and 5 km wide, with satellite settlements and urban sprawl in the lateral valleys, which are isolated from each other and poorly connected to the main road system, primarily oriented along a north-south longitudinal axis (Fig. 1).

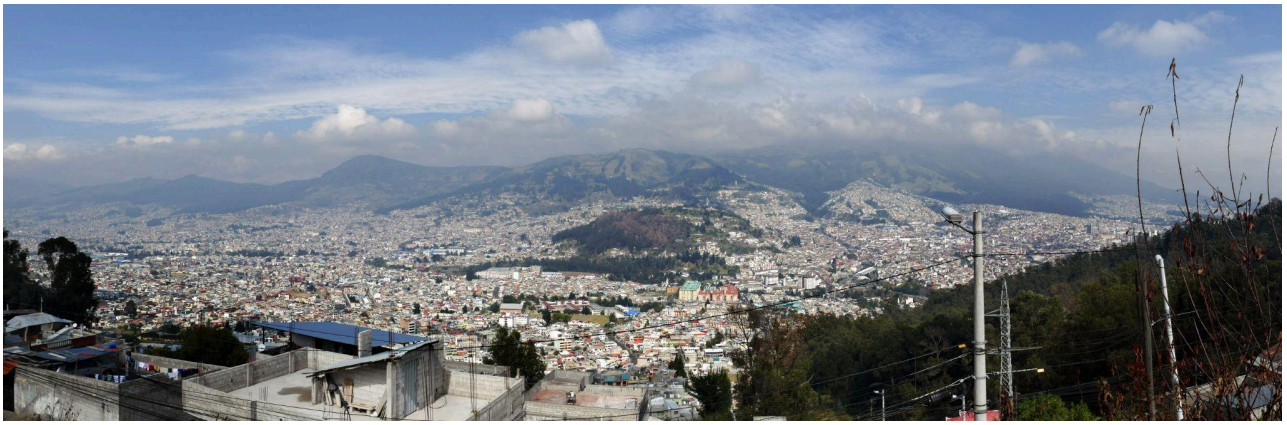


Fig. 1- View of Quito from above, with Panecillo Hill in the centre (Source: F. Alberti, 2024)

The numerous urban and metropolitan plans from the second half of the 20th century to the present - what Lauria (2019) has described as "planning bulimia" - proved insufficient to regulate the pressures exerted by the private sector, facilitated by its proximity with the state apparatus. This has further exacerbated the social inequalities that Odriozola's regulatory plan had already 'institutionalized', leading to the stark segregation between *the city of the rich and the city of the poor* (Secchi, 2013): the former located on the north of the Panecillo, the latter to the south, 'behind [the Virgin's] back', as referenced by the title of a 2011 Ecuadorian film[2]. Since the 1990s, relatively more effective have been the measures aimed at organizing public transport (as discussed below) along with the environmental protection strategies introduced by the *Plan Metropolitano de Ordenamiento Territorial* 2012-22.

3.3 An overview of Quito's transport policies

In Quito, urban transport accounts for more than 60% of CO_2 emissions (SLOCAT, 2023). Although the motorization rate of 173 motor vehicles per 1000 inhabitants of the Distrito Metropolitano is almost 10% above the national average, such impact seems disproportionate with the vehicle fleet, and even more so if we consider that 71% of the daily urban travels are made by public transport, compared to 22% by private car and 5% by motorcycle (Quito Cómo Vamos[3], 2024).

Building on the 1993 *Plan Estructura Espacial Metropolitana*, the city has a Bus Rapid Transit (BRT) system, inspired by the model of 'metro-ized' buses introduced by Jaime Lerner in Curitiba in the 1970s. Quito's BRT consists of three lines that run throughout the city's N-S axis, brought into operation in 1995 (the electric Trolebus), 2001 (the diesel Ecovía), and 2005 (the diesel Metrobus) (Fig. 2). The BRT routes are linked by feeder buses (*alimentadores*) and the entire network is managed by the Public Metropolitan Transport Company. Sixty-two private bus companies also serve the city offering a range of designated routes Additionally, the construction of an underground metro system started in 2016 and, after beginning service in December 2024, has enhanced the city's public transport along the same longitudinal direction.

The *Plan Maestro de Movilidad Sostenible 2022-2042* (PMMS) clearly outlines the goal of continuing to promote public transport while also encouraging walking and cycling, to achieve an ambitious reduction in the modal share of individual motorized means (cars and motorcycles) to just 7% by 2042, along with a 75% reduction in CO_2 emissions from the transport sector. However, some current policies, shaped by traditional, economically driven approaches to urban and transport planning, seem contradictory when applied to the context of Quito in relation to the target of providing "safe, affordable, accessible and sustainable transport systems for all [...], with special attention to the needs of those in vulnerable situations [...]", established by SDG 11 (UN, 2015).

In 2016, an innovative TOD policy was introduced promoting the construction of high-rise, eco-efficient buildings around mass public transport nodes. The initiative aligned with the Compact City concept, as supported by the H-III New Urban Agenda, released the same year (STHV, 2017). Until mid-2022 the legislation was divided into two parts. First, Ordinance 003 provided a general framework for implementing the compact city in Quito. Second, Resolution No. STHV-034-2020 established how real estate

[2] *A tus espaldas*. (2011). [Film]. Directed by Tito Jara. Ecuador: Abrecomunicación Urbanos Films.

[3] *Cómo vamos* is a network and NGO based in the major cities of South America. The aim of the organisation is to provide reliable information to guide public administration policies and ensure that citizens are informed to exercise responsible and participatory citizenship. Their reports offer a detailed analysis of the progress and challenges faced by Latin American capitals over five years intervals. Through the examination of over 200 official indicators, the report assesses 12 key dimensions of urban quality of life, including health, education, security, environment, and mobility. This approach allows for the identification of key trends and areas that require specific interventions, providing a solid foundation for the development of public policies aimed at improving citizens' well-being. The report *Informe de Calidad de Vida 2024* by the local association "Quito Como Vamos" presents data and evaluation on the quality of life in Quito (Source: https://redcomovamos.org/. Accessed: 15 March 2025).

developments could increase building heights near public transit nodes. The Resolution defined specific polygons based on walking distances to BRT and metro stations. Buildings within a BRT polygon could increase their height by 50%, while those near an underground metro stop could increase it by up to 100%. The height bonuses were conditional on meeting ecological design standards, including a focus on mixed-use buildings.

Considered a success by the civil servants involved at the time (Davis and Verlinghieri, 2024) the Resolution underwent various updates and modifications over the years, before ultimately being superseded by the Urban Plan for Land Use (PUGS) in 2024. However, Davis and Verlinghieri (2024) point out that, like many TOD programmes, it had negative impacts on the city in terms of urban and social segregation, mainly due to a divide between urban residents who could afford to live in the new luxury high-rise buildings and those who could not.

As TOD policies are applied along the mass transit lines, the question remains as to how to approach transport in urban areas that face traffic pressures but are outside the catchment areas of the major transport hubs. The construction of new arterial roads to connect Quito's rural parishes to the more densely urbanized areas by crossing the valleys orthogonally to the main plateau, included in the PMMS as part of the 'desired scenario' (Fig. 3), seems to contradict the claim of assigning a marginal role to individual motorized mobility in urban displacements by 2042.

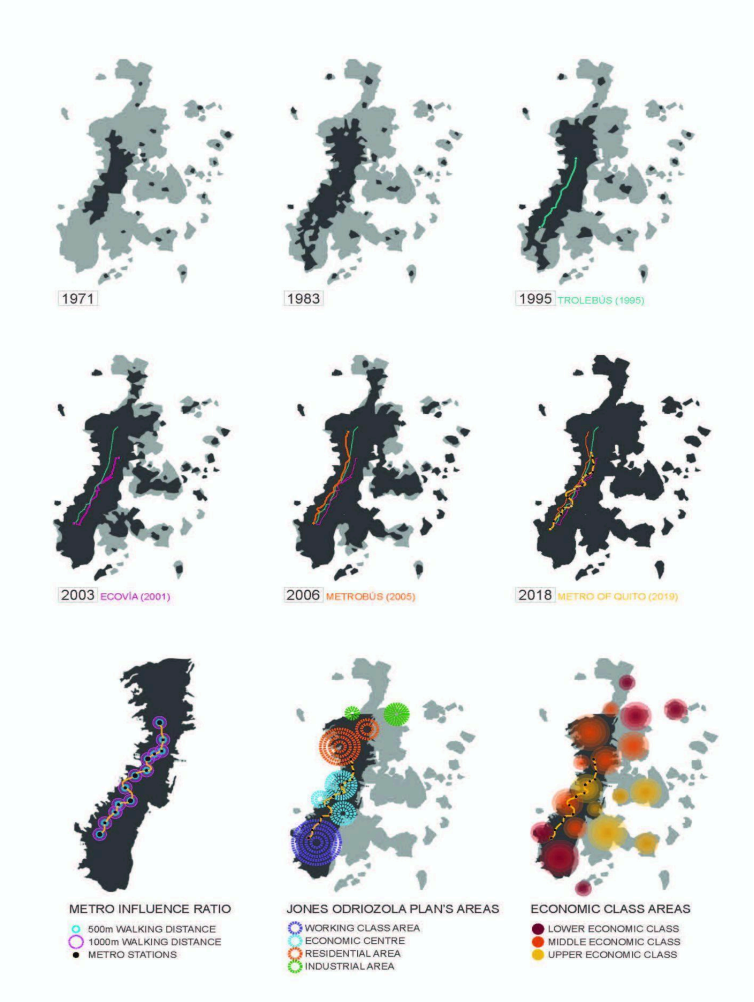


Fig. 2 - The expansion of Quito and its main transport systems from the 1970s to the present day. Based on Davis and Verlinghieri (2024).

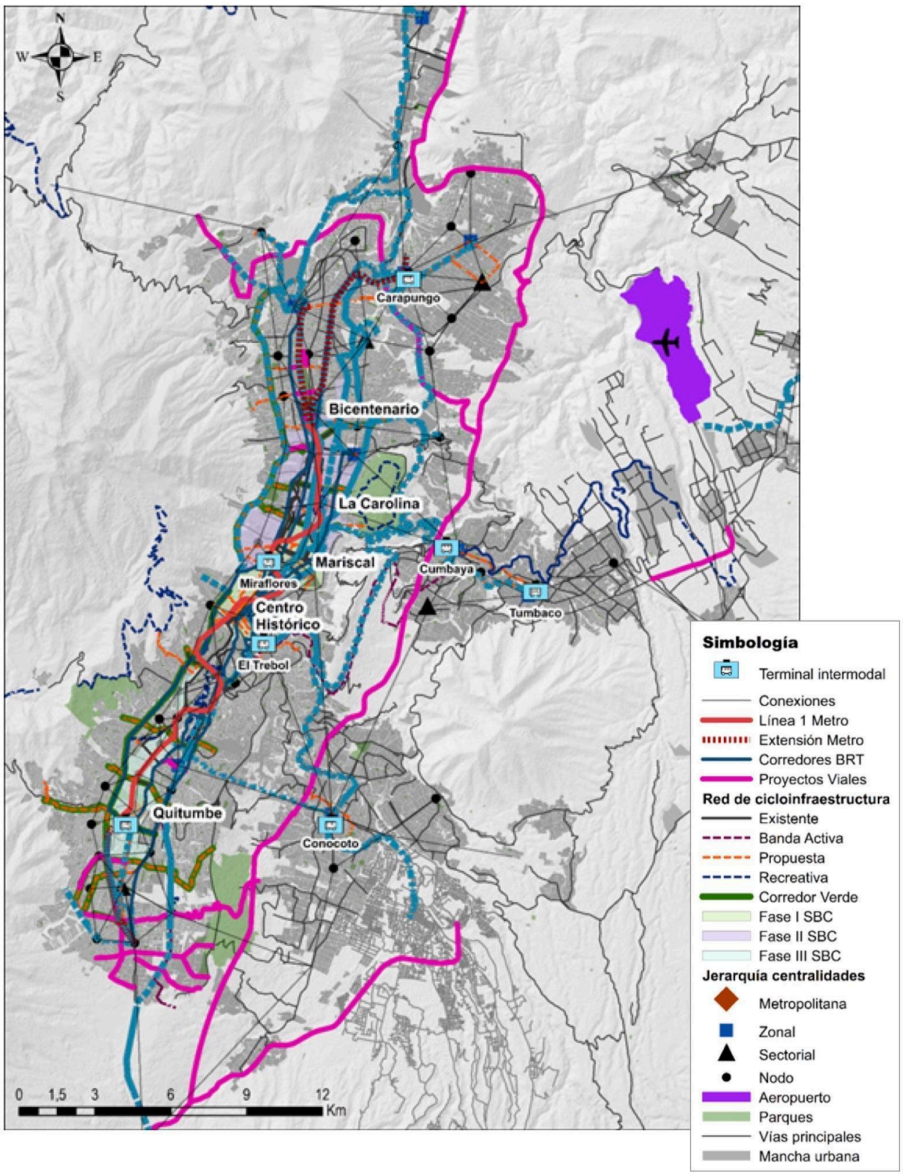


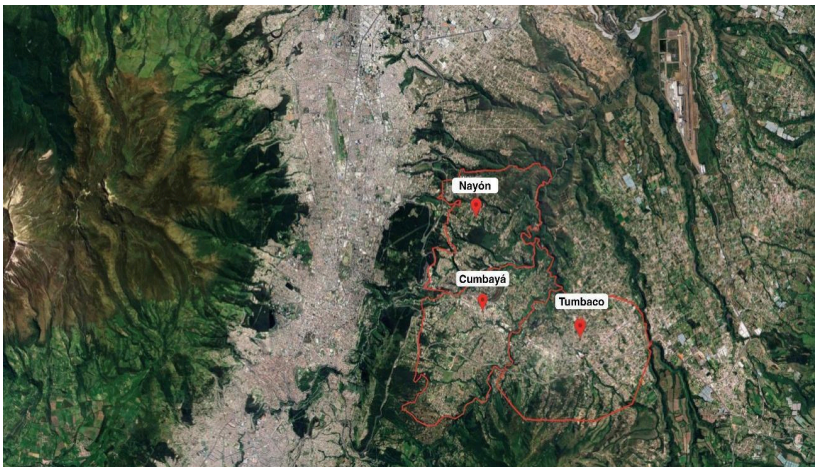
Fig. 3 - The 'desired scenario' delivered by the *Plan Maestro de Movilidad Sostenible* (Source: Municipio de Quito, 2022)

These issues provided the backdrop of the international workshop organized by the *Facultad Internacional de Innovación PUCE-Icam* (FIIPI) of the *Pontificia Universidad Católica del Ecuador* (PUCE) and the *Department of Architecture* (DIDA) of the *University of Florence*, Italy (UNIFI) in November 2024, focusing on Nayón, one of Quito's parishes in the eastern valleys affected by the proposed new thoroughfares.

3.4 The *paroquia* of Nayón

The parish (*paroquia)* of Nayón has experienced a unique socio-economic development, making it an interesting case study for analysing the interaction between peripheral settlements and the urban expansion of capital cities in South America.

Approximately 20 kilometers from Quito's city centre and separated by the large Guangüiltagua Metropolitan Park mountain range, Nayón retains a semi-rural character, similar to the nearby parish of Tumbaco and Cumbayá (Figs. 4-5). Its history spans from pre-Incan times to the age of Spanish colonization, which transformed the region socially and economically. During Ecuador's struggle for independence, Nayón also played a role in the fight for freedom (Simbaña, 2022).



Figs. 4 - The parishes of Nayón, Tumbaco and Cumbayá (Reworking from Google Earth)

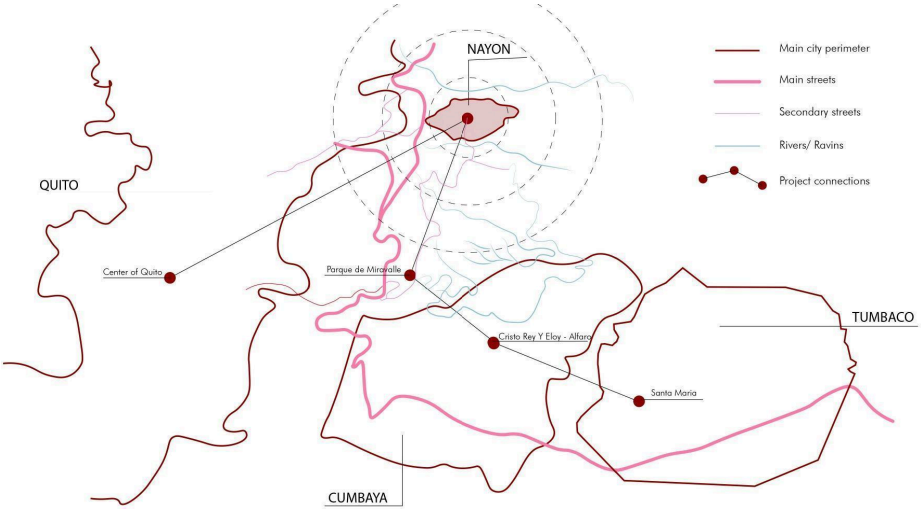


Fig. 5 - Nayón, Tumbaco and Cumbayá and their connections to Quito (Source: Lippi E., Risicaris F., Mugliza, M., Samaniego, J., 2024)

The development of Nayón faces significant challenges, one of the greatest being social and economic inequality between urbanised and rural areas. Historically, Nayón has been linked to agriculture, livestock, and local commerce. In recent years, horticulture has expanded considerably, especially due to trade networks from nearby sectors. The sale of plants, initially informal, has grown steadily, and in the last few decades, family-owned businesses focused on garden maintenance, medicinal herb, and fruit trees - cultivated in local orchards and surrounding mountains - have emerged, supplying markets in Quito. Nevertheless, rural zones, which rely on farming and informal activities, struggle to access quality public services, adequate infrastructure, and stable, well-paid employment (Sanguna and Achig Jonathan, 2024). To address these issues, some projects are promoting urban agriculture and sustainable practices by creating agricultural cooperatives and training programs aimed at improving the living conditions of local farmers and facilitating access to both national and international markets.

Another critical issue stems from, population growth driven by the capital's urban expansion which is fuelling informal urbanization, a surge in housing construction - especially near the city centre - a higher demand for basic services, and mounting pressure on natural resources (Moisés and Díaz-Sánchez, 2018).

The real estate sector has accelerated housing developments along the main road connecting Nayón to Quito, highlighting the need for upgraded infrastructure. However, improvements have been uneven, and some areas still lack access to basic utilities such as potable water and electricity, as well as key infrastructure like sewage systems, deepening disparities within the parishes (Moisés and Díaz-Sánchez, 2018).

A major concern for residents is the lack of efficient transportation. Actually, Nayón is connected to the rest of the city by only one transverse road across the mountain, which winds through the valleys and ascends steep hills via broad bends. Despite its proximity to Quito, public transportation remains insufficient, forcing many to rely on private vehicles, contributing to traffic congestion and a larger carbon footprint.

Environmental sustainability is another pressing issue, as urban expansion has affected essential natural resources, particularly water and land. Urbanization has reduced agricultural land and increased pollution, notably from traffic emissions and construction waste. While green spaces still exist, large-scale development puts them at risk, posing long-term challenges for ecological sustainability (Moisés and Díaz-Sánchez, 2018).

In sum, Nayón faces interrelated challenges linked to rapid urban growth, social inequality, and environmental degradation. Nonetheless, efforts to harmonise rural and urban development present opportunities to enhance the parish's quality of life in the years to come.

4. The workshop

4.1 Workshops as living labs to experiment co-production of knowledge

The collaboration between universities[4] was aimed at investigating how design strategies for urban mobility can help to practically shift the paradigm of sustainability from Global North to Global South and was developed from a different perspective than the institutional plans, based on the following principles:

- the de-sectorization and decolonization of transport knowledge, working on urban mobility: i) in a collaborative and cross-disciplinary way, instead of only in a technical and economic manner; ii) as part of broader urban strategies towards sustainability, instead of as an autonomous policy.
- the prioritization of relatively low-cost improvements to public transportation services and infrastructure over investments in expensive new road infrastructure with high environmental impacts.
- the improvement of the performance of transit hubs by focusing more on social issues (accessibility, safety and security) and environmental issues (zero-emission solutions and energy self-sufficiency) than on the economic benefits of increased density around transit stops.

This collaboration was implemented through an immersive workshop at the PUCE Campus in Nayón (Fig. 6), which put the work group in direct contact with the study area of Nayón and its adjacent parishes, Tumbaco and Cumbaya, where all the above mentioned considerations reflect on the everyday dynamics of the city in a layered and interrelated way.

[4] The academic agreement between the Department of Architecture DIDA of the University of Florence and Pontificia Universidad Católica del Ecuador, signed in 2023, so far resulted in the organization of two thematic seminars: *Design in the Anthropocene: Sun, Water and Soil* (2023), held in Florence, and *Urban Strategies towards Sustainability: Integrating Nature, Energy and Spatial Planning* (2024), the latter divided in two sessions, a preparatory workshop in Florence followed by an immersive design charrette in Quito.

Fig. 6 - View from the top of the PUCE Campus and the residential urban settlement further east of Nayón, Quito (Source: G. Hasanaj, 2024)

The eastern neighbourhoods of Quito are subdivided into urban areas very different from each other, either because they were built at different times, or were the result of informal urbanisation, or were explicitly designed as gated areas with controlled access. This fragmentation is not just a consequence of a varied geographical morphology or different periods of urbanisation, but reflects the socio-demographic structure of this part of the city. Inside the numerous hyper-designed gated communities, shared open spaces are subject to daily maintenance and there is a feeling of widespread social control. Outside, traditional low-rise buildings mix with informal structures, commercial hubs, unbuilt areas - sometimes covered in dense vegetation, some other times used as parking lots or unauthorized dumps of debris; public open space, the connective fabric that should hold together this diversity of spaces, is often not cohesively designed, except for the central heritage *plaza* dating back to the Spanish colonial times, now fully equipped with seating areas and trees.

The electricity cuts, which affected the whole country and were experienced during the workshop period in the study area, seemed to highlight - literally - such diverse geographies in the darkness of the night hours. Nayón and its surroundings, like the rest of the city, were subject to eight-hour-long energy cuts, twice a day, following a schedule variable every two weeks. In such circumstances, although urban life did not stop, the energy supply would be managed in an uncoordinated way and variably, depending on the different areas. While single citizens had to self-organize for the lack of public alternatives, electricity was guaranteed by some private facilities, such as tourist spots in the city centre, or huge floodlit shopping centres which would become social gathering places where people could charge their electronic devices or simply find alternative activities to the ones possible in private homes, left in the dark. Electricity cuts did not spare public lighting, so public space at the appointed time in the evening hours was illuminated only by the lights of cars, often stuck in long traffic queues aggravated by non-functioning traffic lights. Since the supply from renewable sources - such as solar, geothermal or wind energy - does not reach such a widespread diffusion to represent an alternative option to hydroelectric power, the moment energy supply stops, petrol-powered generators come into play, whose constant humming noise spreads through the streets of Quito and whose emissions are as harmful as those of road transport.

Despite the fact that private cars are used by only 22% of Quito's population (Quito Como Vamos, 2024), the limited number of transversal connections and narrow roadways cause constant traffic congestion severely affecting travel speed, environmental conditions, and the quality of public space.

Quito has an extensive bicycle infrastructure, notably the Ciclopaseo, a 30 km route stretching from the city's north to south. However, the city's commitment to cycling infrastructure faces challenges. While the N-S corridors are well-developed, E-W connections are less extensive, primarily due to Quito's complex topography. The city's mountainous terrain poses significant elevation changes, making the construction of continuous, protected bicycle lanes more difficult. Consequently, cyclists often encounter abrupt transitions or gaps in the infrastructure, particularly when traveling towards areas like Nayón. Although in the mornings, on the way to Nayón, groups of sporty cyclists can be seen battling the uphill road to the Quito plateau, bicycle lanes are scarce and unprotected from traffic.

People's socio-economic conditions appear to influence the choice of their means of transport. Expensive, big and accessorised cars driving on the road seem to carry an added value of status symbol that is rooted in local cultural factors and might be difficult to tackle with design solutions; however, the numerous problems of public street space also play an important role in the choice to use public transport and do not help to encourage its use. With the exception of the new metro, which does not serve the study areas, the quality and the overall experience of using local public transport service is very poor, hence its use by 65% of the population (Quito Como Vamos, 2024) seems to confirm its correlation to socioeconomic status. Firstly, there is a problem with constant delays in service due to traffic, generating an endless loop where those who can afford it use their cars, but in turn contribute to the aggravation of the traffic situation. Secondly, the quality of public space at local public transport stops is poor and it is only sometimes equipped with facilities such as canopies and seats. Finally, the perception of safety seems to be a determining factor in transport mode choice. For those who have the option, it is considered safer to experience the street in a mediated way — traveling from the protected space of the home or gated community to a specific destination, enclosed within the private space of a car". In fact, the issue that most impacts the quality of daily life, according to the statistical sample of population surveyed by Quito Como Vamos (2024), is indeed security (76% of the respondents). In addition, 37% of survey participants reported being victims of crime, of which a significant 80% say to have been robbed in a public space, so indeed the perception of insecurity emerges as a major topic in the use of public spaces and public transport.

The same population sample also identifies environmental contamination (9%) perceived as aggravated mainly by private cars, poor quality of public transport (8%) and traffic (4%) among the factors that contribute to impacting the quality of daily life, but also the lack of rules and organisation of streets (for 8% of respondents): this data represents an interesting input to think about how many of these issues can be addressed on multiple fronts through integrated urban design of mobility, as a central theme on which others can converge.

Based on these premises, the design exercise of the workshop was to conceptualise a new multi-modal mobility hub for Nayón as an opportunity to address multiple topics - urban regeneration, sustainable mobility, Nature-based Solutions for climate adaptation, the management of energy supply - with a transcalar approach, from planning to detail.

4.2 The workshop methodology

The workshop methodology was built around co-creation at all stages of the design process, fostering knowledge transfer between experts, citizens, students and scholars as the basic action to start to change, and exchange perspectives. It was structured into several key stages that together formed an integrated and participatory design process aimed at investigating urban mobility strategies in the Global South:

- **Direct cultural exchange through hosting by local families:** although the workshop lasted a relatively short period of two weeks, the Italian students were each hosted by locals. This allowed the visiting group to directly experience some of the impacts of the current socio-political instability on energy, mobility, security, environment and social dynamics, nourishing the final project proposals with first-hand knowledge acquired through fieldwork.
- **Focus Groups with Stakeholders:** the workshop promoted community engagement through a focus group with local stakeholders aimed at collectively discussing the current issues of the transport system, exploring more effective possibilities for the service and defining the essential services to include in a multi-modal transport hub, both in terms of location and spatial characteristics. Roundtables, interviews, insights and direct testimonies from residents, university lecturers, NGO representatives, and public administrators were important starting qualitative data on the perception of public transport and the needs of the community based on three questions: i) main shortcomings of public transport on daily routes; ii) possible features of an ideal public transport system; iii) key elements for an efficient intermodal system. The focus groups highlighted several issues in the local public transport system (Fig. 7): long waiting times (around 30 minutes), poor service reliability, and safety concerns related to robberies and dangerous driving. Road mobility is further exacerbated by traffic congestion on the Avenida Simón Bolívar, the main road connection to Quito, which often becomes a bottleneck and is the cause of significant delays. In addition, a clear social division emerges between old and new residents, with a low propensity for integration, and a general sense of distrust towards the public administration, perceived as ineffective in solving mobility problems. Citizens have responded with independent initiatives, such as petitions to improve traffic management or self-organizing in the proximity of schools. To address these issues, the participants suggested including private sector investments for the maintenance of public open space, expanding street width (where possible) for an easier circulation of public transport vehicles, or creating alternative routes for the increase in the frequency of services.

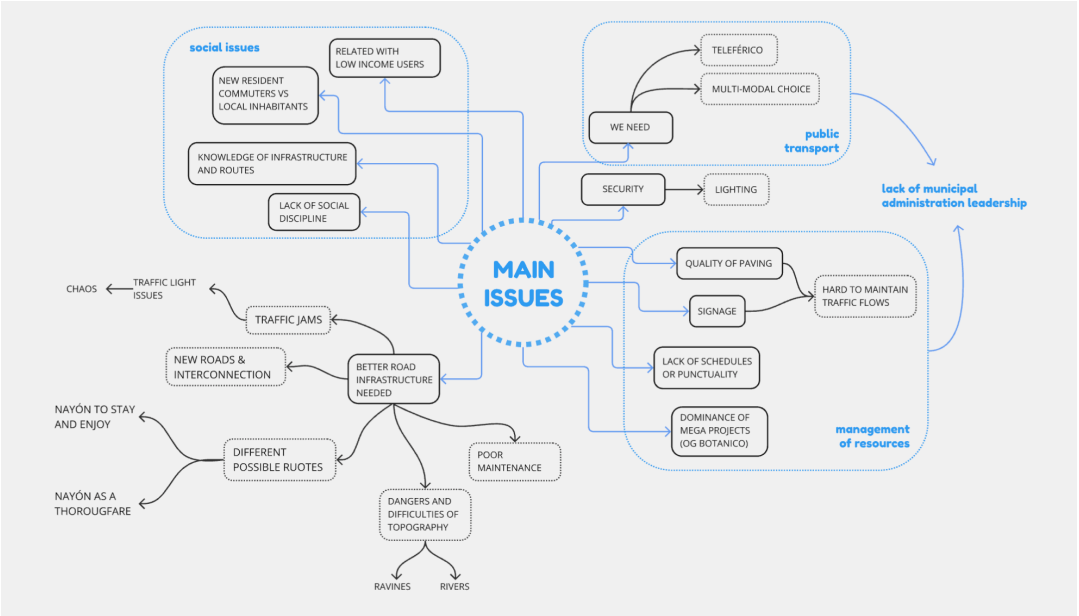


Fig. 7 - A concept map of the main issues related to transport in the area of Nayón (Source: E. Giannini, 2024)

- **Workshop and co-creation process:** punting into practice interdisciplinarity by bringing together students from engineering and architecture disciplines, group creativity methods were employed to ignite collaboration between the workgroups within a limited time frame, encouraging students to leverage their diverse skill sets using mixed media: sketches, concept maps, creative maps. In parallel, site visits provided direct knowledge of the context (Fig. 8). Field observation enabled the

identification of critical issues, local dynamics and opportunities crucial for effective design, and the creation of urban environments that truly respond to people's needs (Jacobs, 1961).

Fig. 8 – The town and road-scape of Nayón (Source: F. Alberti, 2024)

4.3 Project results and findings

The final design proposals identified two possible strategic locations for new transport hubs and explored the key themes through a holistic approach to urban regeneration, as an opportunity to increase the quality of public spaces for residents. The first proposal, named *Connections in Transit*, focused on the regeneration of part of the central square of Nayón integrating modular movable elements with specific functions - bus stop seatings, information boards, canopies, etc - depending on the use of the square at different times of the day. The second proposal, *Nayón Transit Hub: A Green and Social Gateway*, proposed the redesign of a heavily trafficked road near two schools, incorporating a small bus stop station and working on a new spatial layout of the street, integrating sidewalks, cycle lanes, and a new public park, enhancing the quality of public space and promoting a safer, more sustainable urban environment.

The workshop delved deeply into the themes of community and environment, with a focus on the reconfiguration of public spaces aimed at creating high-quality urban design proposals that address the specific needs of residents. Centered around how people perceive and experience urban spaces, the projects worked on finding a balance between space for cars and pedestrian areas, prioritizing the latter to foster social interactions in public spaces, such as in Nayón's main square or along the roadway near schools. Energy concerns were also explored through the design of production systems utilizing renewable sources like photovoltaic, wind energy, and biomass. Safety was another key focus, with careful attention

given to designing effective lighting systems along roads, ensuring sufficient illumination for better visibility at night. The workshop's outcomes though extend beyond the production of design concepts. By addressing transportation challenges from various angles, the workshop gave students a broader perspective on global inequalities and inspired solutions that are inclusive and adaptable to different cultural and infrastructural contexts. The integrated approach put into practice allowed for a more holistic response to project challenges, combining diverse expertise to create innovative, sustainable solutions that alleviate traffic congestion, improve public transport services, and enhance accessibility.

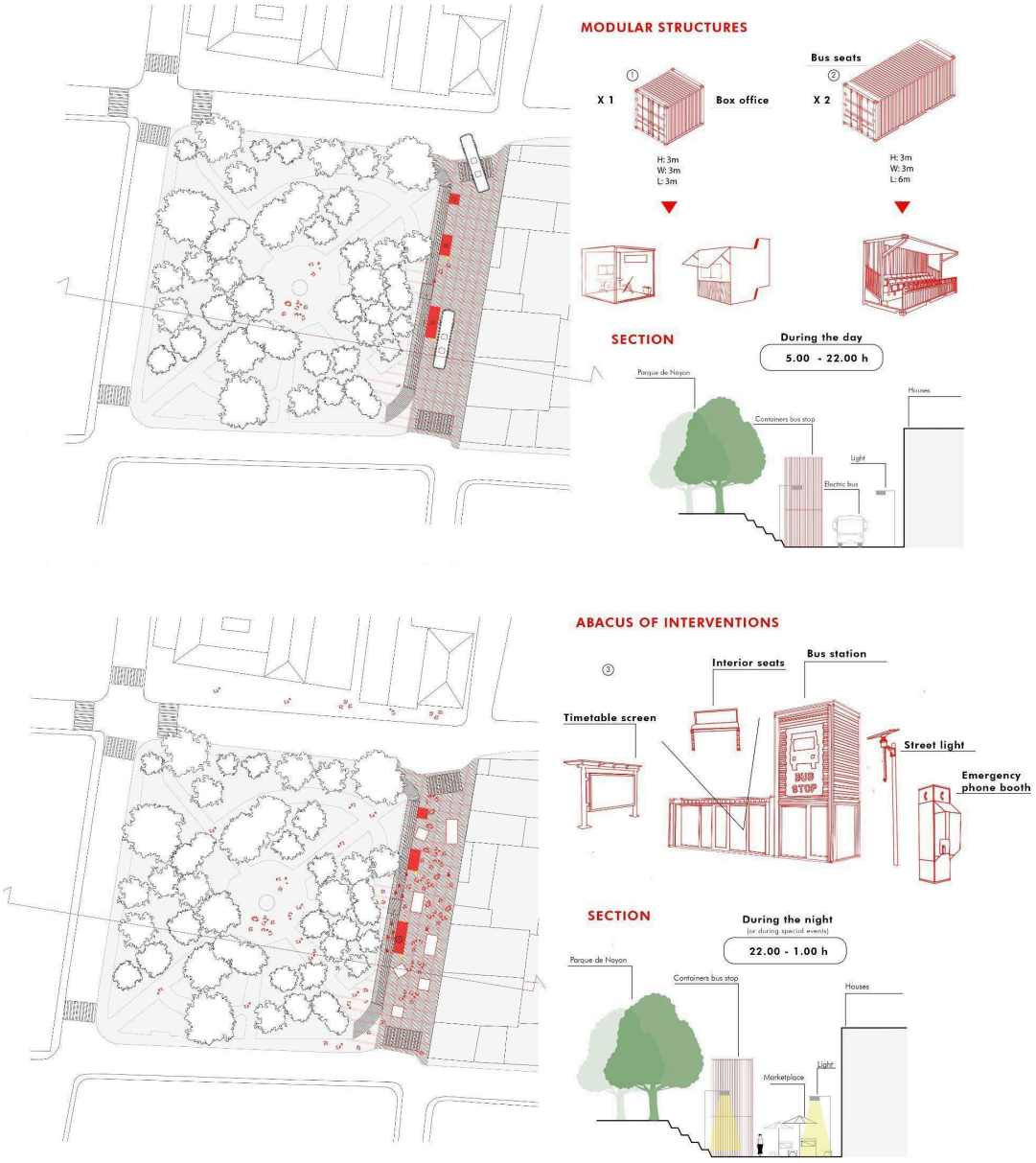


Fig. 9 - Students' proposal for a new mobility hub in the heritage plaza of Nayón: a flexible design for a public space that adapts to a variety of uses and community needs throughout different times of the day (Source: Lippi E., Risicaris F., Mugliza, M., Samaniego, J., 2024)

Fig. 10 - Students' proposal for a new mobility hub and public open space network on one of the main road connections between Nayón and its surroundings (Source: Mannari, O., Morales, J., Gorgone, G., Ballarades, N., Misaraj, A., 2024)

The workshop's results can be reconsidered in light of the dual perspective outlined in the introduction. Initially, the workshop aimed to address the need for de-sectorisation in line with the decolonisation of transport knowledge. This was reflected in several ways: it was led by a knowledge-producing centre in the Global South (FIIPI, PUCE), implying a geographical shift; it prioritised focus groups and observation over

numerical modelling, indicating an epistemological shift; and it considered transport modes beyond formal options, reflecting an empirical shift.
Moreover, the design process adopted a strong, local-first emphasis, helping to avoid the imposition of 'à la carte' solutions imported from other parts of the world (Blanc, 2023). The outcome was the conceptualisation of solutions that were developed, tested and agreed on, not only in the expanding suburb of Nayón, or solely from the point of view of the Global South, but as a collaborative effort between academic teams from the Global North (DIDA) and the South (FIIPI).

Designing with a sustainable approach in the context of the Global South implies considering a series of conditions and specificities that must necessarily emerge from attentive listening to the places to avoid imposing models of Eurocentric vision. Direct observation of each of these aspects led to numerous reflections that were subsequently brought into both the debate and project proposals developed in the workshop. The first is that the city, while facing complex challenges related to the socio-political situation, energy, mobility and security, is anyway showing a level of resilience and adaptability of urban spaces in response to conditions of continuous uncertainty. The second consideration is that putting into value existing quality elements is a fundamental resource for the design of a more sustainable urban model (e.g., supporting spontaneous vegetation and implementing the presence of plants can enhance the already existing ecosystem benefits in the mitigation of air pollution). Finally, an integrated and interdisciplinary approach, with diversified design methodologies, is key to address these interrelated issues.

5. Conclusions

Thinking of the guidelines drawn by Habitat III, the global agenda on strategies and sustainable design solutions for urban contexts, is it truly appropriate to apply a uniform approach worldwide? Social, economic, cultural, and environmental factors often hinder the implementation of standardized solutions for ecological transition. Therefore, it is crucial to acknowledge that these local specificities should serve as the foundation for any approach.
The first note for reflection tackles the topic of the initial conditions of the design process. On the one hand, we are all living on the same planet, irremediably changed by human presence to the point of no return. On the other hand, different contexts present different states of the art for which there are no universally valid rules applicable in all urban areas. On the contrary, contextual conditions, including social, economic and environmental factors, directly affect the design of strategies for sustainable development, or rather, the possible, alternative paths to sustainability.
A second consideration relates to the central role played by local actors. As described in the article, the workshop benefited from the active involvement of residents, which allowed the project work to be oriented according to specific local needs in a manner that differed from well-trodden paths of predetermined design solutions. Sustainability pathways should be activated through place-based projects, closely tied to local economies, and developed with the active participation of local stakeholders. They also draw value from solutions co-developed by actors in the Global South and North, starting from the design parameters as given in the Global South.
Finally, the third consideration concerns the central role that universities play in processes related to the development and promotion of sustainable approaches. Universities are in a position to guide these processes through research and teaching. In this sense, the educational and research experience carried out at PUCE in Quito was certainly a useful experience to reflect on this issue, possibly tracing some trajectories for future work. In a world where academic institutions of the Western hemisphere tend to overshadow those found in nations classed as 'developing', it can sometimes be difficult to bring new narratives and paradigms into mainstream thinking. Education could be an avenue where collaborative activities might enable exchanges to take place whereby ideas of the Global South can freely interact with their

counterparts in the North. The workshop was an example of this. The authors cannot claim to have 'cracked' the challenge of the de-sectorisation and decolonisation of transport knowledge in the realm of urban strategies towards sustainability. However, they can say with confidence it was a step in the right direction. This article underscores how education and collaborative knowledge processes between the Global South and North are vital for sustainable solutions in transport within the limits of Mother Earth.

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