URBAN TRANSFORMATIONS AND HERITAGE FORMATION. THE CASE OF THE TRAIN STATIONS IN VALLE DEL CAUCA, COLOMBIA/

Santiago ARAQUE-COLLAZOS - *DAD- Dipartimento di Architettura e Design, Politecnico di Torino*

Email: santiago.araque@polito.it

María Claudia VILLEGAS-COREY - *Facultad de Creación y Hábitat, Pontificia Universidad Javeriana Cali*

Email: mcvillegas@javerianacali.edu.co

Abstract. The construction of the railroad system in Colombia and its subsequent consolidation throughout the 20th century is one of the symbols of the transformations the country experienced during the last century. This was characterized by the generation of new building typologies adapted to the physical and spatial needs of Colombian society. In the region of Valle del Cauca, in the southwest of the country, one of these new typologies was the train stations, which were distributed throughout the territory, reaching 47 stations, forming a system that functioned as an integrating element of an area historically and geographically isolated by the geological characteristics of the territory. In this way, the stations can be categorized into three groups according to the degree of contextual modification they represent; the first group as town originators, since some show the emergence of populations as a process of consolidation of the buildings used for the railway function and later urban growth given the commercial and industrial activity that arose in their contexts. A second group can be called town transforming stations, where existing settlements benefited from the need to implement a station for passengers and cargo nearby, which promoted the modification of urban layouts, affecting land use and subsequently leading to significant geometric changes. Finally, there is a third group, which includes large and medium-sized cities which allowed the arrival of the train with specific modifications, but which were not as significant as the previous ones. Likewise, in this group there is evidence of the appearance of some minor stations that did not generate urban modifications in their surroundings. These modifications can be studied on the basis of geometric changes in the urban layouts made after the station appeared, or even based on commercial activities, the hierarchy of the station in the towns and the emergence of new squares or parks within historical or consolidated urban realities. Despite the enormous relevance of the railway system, it has been progressively dismantled since the second half of the 20th century, closing passenger transportation since 1980 and being currently relegated to an intermittent cargo system. From this moment on, the evident obsolescence of the system has meant a clear deterioration of the stations, which present phenomena of abandonment, unproper occupation and destruction, thus generating poles of insecurity and deterioration. For this reason, the following research seeks to understand the phenomenon of train stations in Valle del Cauca as an integrated system that is implanted in strategic places of the territory connecting important historical, social and environmental values. Thus, being an integral part of a landscape that can be understood under the parameters of the concept of cultural landscape, and for that reason be the object of future conservation and restoration projects that face the social and environmental challenges that currently threaten these buildings and the existing social and environmental structures, to generate strategies that ensure the valorization of this system, turning the stations into poles of social and cultural development as well as opportunities for environmental restoration and conservation.

Introduction: Historic and Economic Context. The construction and consolidation of the railroad system in Colombia during the 20th century stands as a key symbol of the country's profound transformations. This process marked the shift from an agricultural-based economy toward the first steps of industrialization. Beyond its economic significance, the railroad system generated new building typologies that reflected and adapted to the evolving physical and spatial needs of Colombian society, through the transformation of traditional landscapes by the addition of new layers and elements that would come to configure the contemporary composition of the territory. In Valle del Cauca region, located in the southwest of the country, one of the most notable typologies was the train station. At their peak, 47 stations were distributed throughout the territory, in an interconnected network, that helped to integrate an area historically isolated by complex geological and geographic conditions (Figure 1). These stations, more than functional nodes of transportation, became architectural and social landmarks (Mejía Pavony, 1999), that brought together a geographically separate region (La Rosa and Mejía, 2017).

In this sense, the development of Colombia's railroad system must be understood within the broader historical and economic transitions of the late 19th and early 20th centuries. Especially because until the beginning of the 20th century, the Colombian economy was predominantly agrarian, centered on subsistence farming and regional exchange. The lack of efficient transportation infrastructure reinforced the isolation of many areas, where rivers and mule tracks were the only viable means of communication (González, 2006). A turning point came with the coffee boom, which emerged as the main driver of Colombia's export economy at the beginning of the 20th Century. Coffee cultivation, particularly in regions of Cundinamarca, Antioquia, and the western slopes of the *Andes Mountain Range,* required improved transportation to connect rural producers with export ports on both the Caribbean and Pacific coasts (Valencia Llano, 2018). As Posada Carbó notes, this demand coincided with a broader process of modernization promoted by both national governments and foreign investors, who saw railroads as essential tools to facilitate commerce, attract capital, and expand state presence into remote territories (Posada Carbó, 1998). During the early 20th century, the Colombian state, with limited financial resources, often relied on foreign concessions and capital to construct and operate railroad lines. British and later American companies played a central role in financing, equipping, and managing many of the first systems (Safford, 1989). Despite difficulties, such as political instability, technical challenges in mountainous terrains, and recurring financial crises, the railroad gradually extended across several key regions. In Valle del Cauca, the construction of railways was particularly transformative. This region, long isolated by the Andes Mountain chains, began

to consolidate itself as an agricultural powerhouse in the beginning of the 20th century, through the transformation of traditional cultivation methods, especially sugarcane (*Saccharum officinarum*), into highly productive industrialized processes (Bermúdez Escobar, 1997). The railroads not only connected Valle del Cauca to the port of *Buenaventura* in the Pacific Ocean but also linked it with the country's inner regions, which strengthened both domestic trade and international exports. As Molina Londoño (Molina Londoño, 2012) argues, these infrastructures fostered an incipient process of industrialization, with mills, warehouses, and processing facilities that emerged along the train lines. Thus, the Colombian railroad system cannot be reduced to mere infrastructure. Since, it represented a structural pivot in the nation's economic history: from local economies of subsistence and regional isolation toward a model of national integration, export-oriented production, and early industrial growth.

Train Stations Historical Typologies in Valle del Cauca. Therefore, train stations in Valle del Cauca were not only static structures, but active elements that have always influenced the urban morphology of cities and towns, which in turn has contributed to the consolidation of the contemporary local cultural character, that has based itself on the significant symbols and sites of the region. This highly stratified group of cultural sites is tightly linked to the region's history and development, and thus, they share similar values and an innate connection that links them to each other, but above all to their environment, which is represented by the natural landscape characteristic of the Cauca River valley. Some of the sites are for example, industrial and transportation legacies of the railroad systems, such as warehouses, bridges, and roads, or older architectural typologies, such as the *Casas de Haciendas* system, built during the Spanish colonial domination period, that goes from the 16-18th centuries until the second half of the 18th century. In this sense, these buildings not only have value in themselves, but also, having historically structured both urban and rural areas, they are evidence of the passage of time in the region, as well as examples of society's adaptation to its natural environment.

In the case of the train stations in Valle del Cauca, this characteristic can be observed in the degree of impact they brought to their immediate urban surroundings. In fact, it is possible to classify them into three groups based on the level of transformation of their contexts (Zambrano, 2007):

1. Town-Originating Stations: Refers to stations that gave birth to new urban settlements, such as *La Cumbre*.

2. Town-Transforming Stations: Refers to stations that were located in existing urban settlements, but their introduction meant important transformations in the existing urban structure, such as *Palmira*.

3. Limited-Impact Stations: Refers to stations that were built within already existing urban settlements and their appearance had minimal influence on the urban development of the cities, such as *Cali*. (Figure 2)

La Cumbre Train Station. The town of La Cumbre offers a clear example of a settlement that originated directly from the presence of the railroad. Before the arrival of the station, the area was sparsely populated, with limited agricultural activity and little integration into the broader economic circuits of the region. Perhaps the most remarkable feature of *La Cumbre* lies in its architectural typology. At the beginning of the 20th century, most constructions in Colombia were built with brick or adobe, following traditional methods. However, the chief engineer of the railroad, an American, introduced local workers to the use of wood-framed construction, a technique uncommon in the country at the time. Many of the houses built in La Cumbre, eventually adopted this method, which has produced a distinctive architectural identity that set the town apart from nearby settlements (Molina Londoño, 2012). Over time, La Cumbre's urban form reflected its genesis, with the station not merely inserted into the town, but constituting its very origin (Figure 3). Yet, the progressive dismantling of the national railway network in the second half of the 20th century diminished this centrality. Passenger services were definitively closed in 1980, and the railroad has since been relegated to an intermittent cargo system, leaving the once-vital station in decline.

Palmira Train Station. Unlike La Cumbre, which originated as a settlement around its station, Palmira exemplifies the second typology of town-transforming stations. Already established as an agricultural center in the Valle del Cauca, Palmira experienced deep changes with the arrival of the railroad. The most significant transformation occurred in the geometry of the town's layout. Palmira had originally followed the typical colonial grid defined by "*Leyes de Indias*", which generally consisted of a central squared plaza, which represented the spatial center of the city and from which new squared blocks were laid out parallelly to the plaza's segments (Zambrano, 1993). The arrival of the railroad disrupted this order, introducing a transversal layout that cut across the colonial pattern. As Zambrano observes, the imposition of modern infrastructures frequently unsettled colonial urban orders, forcing towns to expand in directions not originally foreseen (Zambrano, 2007). Around the station, new commercial activities, markets, and services emerged, shifting the hierarchy of urban spaces and stimulating the creation of new public areas. The station thus became an alternative focal point, rivaling the central plaza in importance, and reshaping the hierarchy of Palmira's urban life. Economically, Palmira consolidated itself as a powerhouse of sugarcane production and agricultural exports. The railroad attracted industrial warehouses and processing facilities, reinforcing its role as a hub that connected the fertile valley with Buenaventura and beyond (Figure 4).

Contemporary Obsolescence and the Memory of the Stations: A Lynch Approach. Unfortunately, after the 1980s, various social and economic dynamics led to the defund of the Colombian railway system, which contributed to its progressive decline until its disappearance in many areas, or its relegation to solely cargo transportation system. By the end of 1990, the *Pacific Railroad* (Ferrocarril del Pacífico), name given to the railway system in the Valle del Cauca, had become virtually obsolete, which also meant the loss of the stations' main function. These were progressively abandoned, reused, or incorporated into different dynamics (Eduardo Nieto, 2011). Today, Valle del Cauca's train stations can also be classified by their current state of occupation and obsolescence:

Stations used as private residences, illegally appropriated and used as single-family or multi-family dwellings. A dynamic that has contributed to heavy

interventions and overall decay produced by unscrupulous modifications.

Stations with Functional Interventions, adapted for office spaces or warehouses, but stripped of their symbolic public role. That is the case of Palmira's train station which hosts today the offices of the municipality culture secretary, and the train station in Cali, that is today both the headquarters of Metro Cali S.A, company that manages the metropolitan transport of the city and the Transportation Museum.

Stations in Total Abandonment, neglected and left to decay. Which, in turn, had contributed to the transformation of these sites into insecure or forgotten areas. This is the case of Andalucia train station, composed of two buildings with no evident function and presenting severe material decay (Figure 5.)

Despite this situation and the neglect with which these buildings have been treated, train stations continue to be an important part of the memory of many people who lived in the first and second half of the 20th century. However, in order to deepen the understanding of train stations, between 2015 and 2020, this research applied Kevin Lynch's methodology from *The Image of the City* (Lynch, 1960). With the aim of understanding the significance of the stations today through first, the memories of the local communities, and second, through the cultural values attached to the buildings. For this reason, a total of 15 towns were visited, each representing one of the three historical station typologies mentioned above. In each case, participants in the main square were invited to mark the most important buildings on a blueprint of their town using stickers differentiated by gender and age (women with stars, men with circles; children in yellow, adults in red, elderly in blue). Each participant placed three stickers freely. The results obtained during the research are interesting, as they show a direct connection between the level of relevance that stations have in their communities and the historical role they played in the urban composition of their respective towns. In this sense, *La Cumbre's* station, which is a generator station, was overwhelmingly recognized as the most important and iconic building in the town. Likewise, Palmira's station, which, as explained above, falls into the category of transformer stations, is only partially recognized and shares this recognition with other landmarks in the city. Meanwhile, in stations with limited impact, only older population was able to remember them, while younger generations are not even aware of their existence. Furthermore, it was possible to understand that there is no direct connection between the current state or function of the stations and the perception of the local community, which indicates that cultural importance is strongly based on the memory of historical typology.

Train Stations: A Notion for a future Cultural Landscape in Valle del Cauca. Since 1996, as result of the Decree 746 of April 24 of that year, all train stations were declared part of Colombia's architectural heritage or assets of cultural interest BICs (by its initials in Spanish). The recognition highlighted the historical, aesthetic, and technical values associated with them. In Valle del Cauca, however, these values are intrinsically linked to the social, territorial and historical characteristics of the development of the region, which together consolidate a well stratified heritage that captures within its layers the complexities, positive and negative, of the history of the region. This implies that the train stations' cultural significance is closely related to other existing elements that embody this heritage stratification. For instance, there are the natural features of the area, composed primarily by the remnants of native tropical dry forest, the Cauca River basin, the regional hydrographic system, and geomorphological formations such as the Farallones mountain range. Additionally, there is the Casas de Haciendas heritage system that, similarly to train stations, spread throughout the territory with unique natural, technological and architectural adaptations. This system is composed of 20 different complexes, built way before the appearance of the railway system, mostly during the 16th, 17th, and 18th centuries. These two elements exemplify the way in which society has organized, developed and transformed itself through internal and external adaptations of both the social structure and of the natural features of the environment. It is this relationship between human activity (anthropic system) and natural features (natural system), that UNESCO recognizes as a cultural landscape (Fowler, 2003).

For several years now, there have been different initiatives to recognize the values of the anthropical and natural dimensions in Valle del Cauca as a cultural landscape, which has always produced strong reactions from many sectors. The question is highly problematic, due to the fact that these initiatives have identified as main cultural element the sugar cane cultivation, in fact these proposals have used the term Sugar Cane Cultural Landscape (La Silla Vacía, 2024) which in essence cannot be recognized as landscape by itself, as it doesn't represent the sustainable relationship between human activity and the natural environment. However, what could be recognized as cultural landscape is the long and continuous transformations of the territory, at least since the early 16th century, in which different elements of high cultural significance are contained, such as unique landscape units, traditional practices and architectural typologies (Giraldo Díaz, 2010), of which train stations are of vital importance (Galindo and Villegas, 2016). The cultural values of these systems are evident and are better described under the definition of an organic and continuous evolution landscape by UNESCO (Mitchell et al., 2009). Naturally, this new cultural landscape name cannot focus on only one, and often problematic, aspect of the territory such as the sugar cane cultivation, but should embrace a wider definition that better describes the territory, perhaps, referring to the Geographical valley of the Cauca River. Moreover, the cultural landscape declaration should not be considered as a crystalizing recognition that perpetuates existing difficulties and imbalances, instead it is the opportunity to carry out structured strategies that contribute to picture, contrast, repair existing issues through research, innovation and cultural development that a declaration of a cultural landscape usually entails (Pents and Albert, 2023). As can be seen for example in the Coffee Cultural Landscape in Colombia recognized in 2011 by UNESCO. In this sense, this new approach enables the opportunity to directly tackle the main weaknesses other proposals have faced, specifically in two main areas, the existing environmental pressure, and the difficult, and often complex, social legacies of the development of Valle del Cauca (Uribe Castro, 2014).

With these two main structuring issues in mind, the new cultural landscape can develop action plans that focus, first regarding the natural dimension, on the documentation of the existing negative environmental effects that currently represent a threat to the natural environment of the area (Pérez Rincon and Tadeu Fabricio, 2013), so that new and more innovative proposals can be made for the strengthening and expansion of dry forests remnants and wetlands ecosystems. While new and more sustainable cultivation models are introduced to reduce their impact on local ecosystems. Second, in regard of the social complexity result of the violent dynamics that characterized the expansion of the sugar cane production model (CNMH, 2014; Comisión de la Verdad, 2022), the cultural landscape can introduce the conception of difficult or dissonant heritage, which in essence represent the cultural significance of sites in which painful events have taken place and are, therefore, interpreted in contrasting ways by the local community (Ashworth, 1996). In this way, past events and their physical legacies, even if negative, increase the overall cultural value of the entire system, as their conservation creates important dynamics of development, memory, and especially social and environmental reparation (Kisic, 2016), which is fundamental in the Colombian context (Beltrán, 2021). In this way, the cultural landscape can promote the generation of joint management strategies and plans at a regional level, mobilizing funds, knowledge, and new cultural projects that benefit local communities. In this way, fostering local development dynamics that improve the well-being of locals through the identification, conservation and enhancement of cultural heritage (Schmitz and Herrero Jáuregui, 2021).

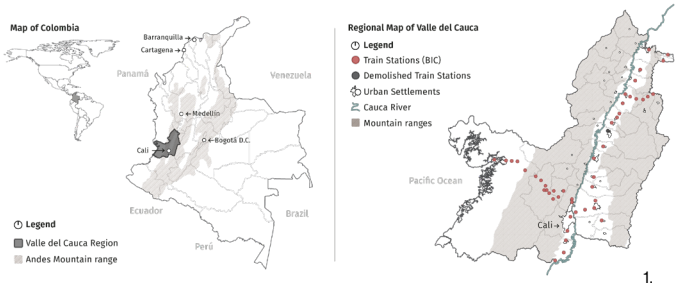
Conclusion. The history of the railroad in Valle del Cauca reflects the paradox of progress and neglect. Stations that once served as hub of connectivity, urban growth, and industrial development are today marked by obsolescence, informal appropriation, or abandonment. Yet, as this study demonstrates, their significance extends beyond functionality. Through their impact on urban form, their role in shaping local identity, and their persistence in collective memory, the stations constitute an essential part of the region's cultural landscape. The 2015–2020 fieldwork, inspired by Kevin Lynch's methodology, highlights the urgency of reconnecting younger generations with this heritage before memory fades. Far from being ruins of a lost modernity, these stations can become opportunities for adaptive reuse, cultural revitalization, and environmental restoration processes, that contribute to the solution of already identified environmental and social issues, through their consolidation as a part of a cultural landscape in the geographical valley of Cauca River. To do so, the implementation of innovative strategies that consider this heterogenous heritage as an integrated system that preserves history, memories, and testimonies of a society that has always been in constant change and growth, is of utmost importance, even despite the complex dynamics that have characterized the recent history. However, the formulation of these strategies requires deeper researches from different knowledge areas, in order to better understand and portrait the natural conditions of the existing natural features, and to identify existing sites in the region that embody the immaterial memory of the difficult social events that have occurred during the last decades, in order to strengthen and promote a more sustainable cultural identity, that is conscious of its natural and social environments, and of the complexities and tensions, but also opportunities that compose them.

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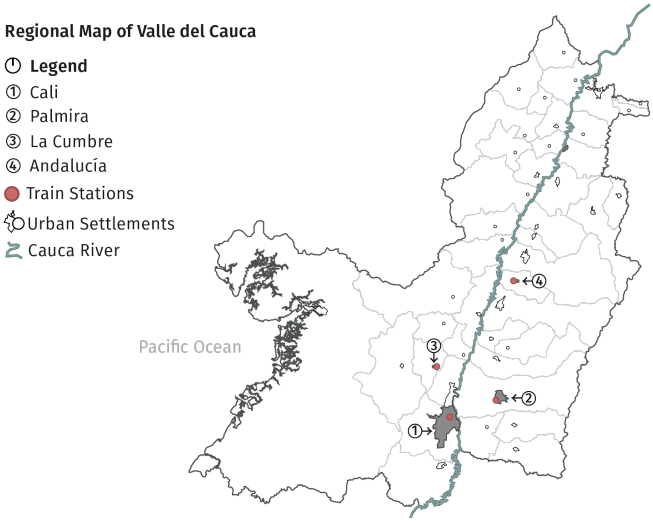
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Figures.
Figure 1- Colombia and Valle del Cauca Map with Train Stations Declared as Colombian Heritage (BIC) / Created by authors.
Figure 2- Map of Valle del Cauca (Cali, Palmira, La Cumbre and Andalucía) / Created by authors.
Figure 3- La Cumbre Train Station heavily vandalized / Photo by CalinkaPF, CC. *Attribution-Share Alike 4.0 International.*
Figure 4- Palmira Train Station Today, 2025 / Photo taken by authors.
Figure 5- Andalucía Train Station presenting important decay typologies, 2024 / Photo taken by authors.



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THE REGENERATIVE NEXUS: GREEN TRANSITION IN ARCHITECTURAL EDUCATION (THE "INCEPT" MODEL)/

Angelica STAN, Mihaela HĂRMĂNESCU, Daniel ARMENCIU, Sorin MANEA - *University of Architecture and Urbanism 'Ion Mincu' Bucharest.*

Ana MRĐA, Mia ROTH-ČERINA, Zoran VERŠIĆ, Marin BINIČKI, Stanka OSTOJIĆ - *University of Zagreb, Faculty of Architecture.*

Georgi GEORGIEV, Eleonora GAYDAROVA, Zdravko GEORGIEV, Petar PETROV - *New Bulgarian University.*

Email: armenciu.daniel@gmail.com

Abstract. The INCEPT project introduces a critical pedagogical shift to align European Architectural Education with urgent Climate-Neutrality goals, specifically addressing the vast challenge posed by the existing built environment. Recognizing that regenerative design must fundamentally oppose linear "design and demolish" practices, INCEPT developed three interconnected intellectual outputs to cultivate a high-conscious and action-oriented professional generation. Firstly, the project produced a comprehensive Compendium on the Green Transition which systematized theoretical knowledge in key areas: circular economy principles, low-tech sustainable design, and life-cycle assessment (LCA). This resource provides a foundational knowledge base essential for transitioning architecture away from high-carbon materials and operational inefficiency. Secondly, the creation of an Online Training Course extended this essential knowledge—from zero-emission strategies and bioclimatic design to digital lifecycle management (BIM/Digital Twin)—to a wider professional and academic community, ensuring broad dissemination of current best practices across the European building stock. Thirdly, the innovative Climate-Neutral Building Design Atelier functioned as a "Living Lab" across Zagreb, Bucharest, and Sofia. This interdisciplinary studio centered its methodology on the adaptive reuse of complex urban sites, including heritage buildings and brownfield voids. By applying the learned principles to real-world interventions, students successfully integrated regenerative systems, low-carbon materials, and circular design details, validating an educational model focused on heritage respect and systemic environmental thinking. The collective results demonstrate the efficacy of making adaptive reuse the central, necessary skill for architects committed to a truly regenerative and circular future.

Keywords: Climate-Neutral, green transition, architecture students.

Introduction: 1.1 The global imperative: redefining the built environment. The architectural and construction sectors stand at a critical crossroads, facing a crisis of relevance rooted in the global climate emergency. With buildings responsible for approximately 40% of worldwide CO2 emissions (Lucon et al., 2014), Europe's strategic objective of achieving climate neutrality by 2050, as outlined in the Green Deal, necessitates a radical transformation of the Built Environment. This imperative is formalized by ambitious energy directives, including the imminent shift toward Zero Emission Building (ZEB) standards. This evolution fundamentally challenges conventional practice, pushing the focus from purely addressing operational energy (energy used during a building's life) to aggressively mitigating embodied carbon (emissions locked into materials, construction, and demolition). This paradigm shift spotlights the critical value of the existing building stock. Every structure embodies significant materials and cultural history, yet urban development frequently targets neglected spaces (including urban voids, abandoned lands, and brownfield sites) for demolition and replacement. A truly regenerative approach cannot succeed by perpetuating this linear, resource-intensive model. Instead, it must treat existing structures, irrespective of their condition, as invaluable material resources ripe for adaptation.

1.2 The Pedagogical Gap: cultivating the regenerative approach in architecture. To meet these complex challenges, the architectural profession requires a new generation of practitioners equipped with systemic thinking that seamlessly integrates ecology, engineering, circular economics, and heritage conservation. Unfortunately, most contemporary architectural education suffers from a pedagogical gap, often treating sustainability as a fragmented, technical add-on rather than a foundational design principle. We argue that the future architects must possess the capacity to perceive the global material and energy flows inherent in local design decisions. This requires moving beyond merely designing sustainable buildings towards actively designing for regeneration and net-positive impact. The core skill set for this transformation is anchored in adaptive reuse and the application of circular economy principles.

1.3 The INCEPT Response: An Integrated Educational Framework. The Erasmus+ INCEPT project directly tackles this educational deficiency by developing, validating, and implementing a comprehensive framework for a circular and climate-neutral curriculum. INCEPT operationalized this vision through three interconnected Intellectual Outputs:

The INCEPT COMPENDIUM on the green transition, conceived as a systematized body of knowledge covering circular economy principles, Low-Tech design, life-cycle assessment (LCA), and bioclimatic strategies.

The CLIMATE-NEUTRAL BUILDING DESIGN Atelier, an innovative Living Lab methodology, validated across the diverse urban contexts of Zagreb, Bucharest, and Sofia, dedicated to the hands-on transformation of existing structures.

The ONLINE TRAINING COURSE ON SUSTAINABLE ARCHITECTURE, a suite of coursees designed for professional outreach, extending expertise to a wider audience.

The concept of INCEPT Project is associated with the strong motivation to align architectural education with the energy and climate goals at national and EU level taking into account the paramount role of the built environment. INCEPT Project aims to contribute to the EU energy decarbonisation targets for the building stock, which requires energy efficiency measures, switching to renewable heating and cooling systems, and improving resource efficiency and circularity in buildings throughout