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## URBAN REGENERATION OF MEDELLIN. AN EXAMPLE OF SUSTAINABILITY

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### HIGHLIGHTS

- There is an intrinsic relationship between urbanism and social welfare.
- The urban chaos promotes the appearance of areas lacking urbanization, infrastructure and endowments.
- The lack of minimum services makes these areas unhygienic for life and that crime and marginality grow in them.
- The forced regeneration in the city has to contemplate the urban and social perspective, and thus becomes an example of sustainability.

### ABSTRACT

The city of Medellin has suffered a chaotic urban growth since early twentieth century, caused by the echoes of industrialization suffered in its historical fabric and by the migration of people from the countryside to the city. As a consequence, the central areas were abandoned and numerous peripheral pieces were built which drowned the traditional city. In this way, the regular and orderly original city became composed mainly of disconnected peripheral tissues, lacking in organization, infrastructures and minimum services, unhygienic fabrics with inhuman living conditions on which delinquency and marginality also grew, becoming the most dangerous areas of the city.

The urgent solution to the problems unleashed brought with it the realization of a series of urban and social reforms. The construction of a new way of transport was a definitive agent in the sustainable regeneration of the city. At this point we have the purpose of this research that aims to highlight the role of metro-cable in the process of urban regeneration, transforming Medellín from being one of the most dangerous cities in Colombia to an example of sustainability.

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## 1. INTRODUCTION

Throughout the last century, the cities of South America experienced a vertiginous growth as a consequence of massive migration of the inhabitants of the countryside to the city, and of the process of industrialization suffered in their urban tissues. These events generated a generalized urban chaos that manifested itself in the abandonment of the central areas and the construction of numerous peripheral pieces that pretending to be urban were far from it. The new pieces were the antithesis of what should be a sustainable city, they were dispersed, lacked organization, infrastructure and minimum services. The situation described was aggravated in many places by the shape of its territory, which accelerated even more the massive urbanization of the peripheral territory and the saturation of the central tissues.

The issue is that the urban chaos ended up also unleashing serious social problems. The central areas were obsolete, with a high rate of marginality, degraded by crime, occupation of public space or by prohibited uses. The peripheral areas soon became the most dangerous areas of the city. Given this situation arose the need to seek solutions that aimed at urban and social regeneration intervening in both the central and peripheral areas. But the social and urban problems should not be faced from different points of view, both were closely related and it was necessary to look for a common way of acting.

Hernández Aja (2000) defined urban regeneration as the set of actions applied to an urban crisis area aimed at curbing the dynamics and decline factors reactivating the local capacity to face urban, social and economic changes. With his words he highlighted the intrinsic relationship between urban transformation, and the economic, demographic and social aspects of it. On the other hand, Jacobs, Cairns and Strebel (2007, p.610) also spoke of the inherent relationship between urban and social transformation, making special reference to the leading role of public spaces in it. They affirmed that if the inhabitants of the obsolete zones were made with squares, feelings of property would have generated that could've caused the improvement of the society and the social integration.

Currently, regeneration processes are considered as essential guidelines for building a sustainable city model that integrates economic, social and environmental aspects (Castrillo, Matesanz, Sevilla and Sánchez, 2014). In the words of Bartón: *"Urban sustainability aims to reduce poverty and improve intergenerational and equity in order to*

*propose improvements in a broad sense of the quality of life of the inhabitants"* (Bartón, 2008). In this sense, these processes are carried out by relocating activities, modifying uses, or building new facilities, free spaces and infrastructures, the last three elements would play a fundamental role because they ensure the coherence and integration of the area in question, in the city.

ONU Habitat (2013) gave different guidelines to countries that had to assimilate the strong population growth, and stressed the importance of betting on public spaces, equipment and infrastructures as fundamental catalysts of urban regeneration, alluding to its great capacity on transformation of the habitat. Let's not forget that the public space, in addition to structuring the city and meeting mobility needs, also contributes to the improvement of social relations and community life. This is why Jaime Lerner, when talking about regeneration, points out the importance of designing public space, and in his definition of "The urban acupuncture" he emphasizes it as one of the instruments to cure the city (Lerner, 2006). And Gehl refines even more and affirms that a city is habitable when it offers freedom of choice in terms of mobility (Gehl, 2008). It is important to emphasize that the lack of mobility contributes to marginalization and social exclusion (Ureta, 2008).

Mobility is closely related to transport although it is obvious that you do not need to resort to transport to get it. However, transportation is the infrastructure system that ensures the connection between the center and the periphery with the activities of the city so the length of the distances makes it sometimes the only resource to facilitate mobility. Although it is also true that the poor quality of urbanization or the topography of the terrain make difficult for traditional transport to access outlying and obsolete areas and contributes even more to the isolation of these areas and their inhabitants in social life. They reduce the possibilities of education, health care, employment, leisure, etc. Furthermore, this lack of accessibility and mobility make impossible the implementation of these public spaces, hindering one of the fundamental premises for urban regeneration. Therefore, mobility and accessibility are fundamental factors to break the physical and social barriers between the central and peripheral areas of the city. In this sense, the intervention in the public space, and the "urban acupuncture" through the transport systems, is manifested as a successful option for urban regeneration, articulation and reintegration of society.

Taking into account the above, the purpose of this research arises, which details the study of the city

of Medellín, which went from being one of the most dangerous cities in Colombia to an example of urban regeneration, thanks to the implementation of a successful system of equipment distributed throughout the city and the construction of a new transport system: the metro-cable. Element through which not only access and interconnection was achieved among the most disadvantaged areas of the city, reintegration and social cohesion were also ensured, in addition to placing the city as an example of sustainability.

## 2. METHOD

The research is carried out from a brief analysis of the physical environment and the urban conformation of the municipality of Medellín, which is complemented with a more detailed analysis of the current urban circumstances in general and the metro-cable project in particular. The topographical questions are explained from the consultation of diverse cartographic and planimetric sources. The study of the object of the research: the metro-cable, is made from a thorough analysis of a large number of scientific texts and consultation of various institutional sources that provide evidence from different studies of what has been developed in the research.

## 3. MEDELLÍN, CITY, TERRITORY AND URBAN PLANNING

Medellín is located in the Aburrá Valley on the banks of the Medellín River, on the Andes mountain range. It is part of a conurbation of 10 municipalities that reaches 3,550,000 inhabitants, although only about 2,400,000 are concentrated in it. Topographically irregular, within its urban landscape different altitudes are reached, ranging from 1470 m above sea level in the central zone, to 3100 m on areas of El Romeral, Padre Amaya or Las Baldías. With an area of 328 km<sup>2</sup>, the urban fabric is divided into 249 official neighborhoods and twenty institutional areas, located on both banks of the Medellín River.

The original, organized and planned city suffered at the beginning of the 20th century a chaotic development lacking in planning motivated by the process of industrialization that took place on the banks of the Medellín River, and by the migratory

movement of the inhabitants from the countryside to the city. All this resulted in a generalized abandonment of the central areas and a massive invasion of the peripheral territory that demanded new services and infrastructures. Aware of the problem, the government entrusted Paul Wiener and Jose Luis Sert with a regulatory plan for its transformation in 1950.

However, in the eighties the problems worsened further; they began to occupy topographically impossible areas and untidy growths developed, without free spaces, equipment, communication systems or basic infrastructure, areas where residential precariousness prevailed and which interconnection was impossible due, among other factors, to the topography of the land itself. This chaos fostered the increase of marginality and crime, which in turn further enhanced this situation. As a result, many marginal neighborhoods appeared, authentic urban ghettos, socially excluded and with unbearable living conditions.

The urgent urban regeneration that the city needed culminated with the realization of a series of projects in 2004. Projects integrated in a program of social, political and educational reforms that not only managed to reactivate the degraded zones, but also contributed to a regeneration of society: comprehensive urban projects, herein after (PUI). But it was not only these projects that brought the solution to the problems posed, the inclusion of the metro-cable as a new transport system that interrelated urban interventions, achieved the definitive integration of obsolete and peripheral areas of the city.

The main objective of the PUI was to reactivate the problematic areas of the city, contributing to the potential and improvement of the public space, based on the provision of strategically located public facilities. Through the PUI, accessibility was improved in all the intervened areas, urbanization was improved and the social integration of the different urban areas was also achieved. Echeverri and Orsini (2010) defined them as "an instrument of planning and physical intervention in areas characterized by high rates of marginality, segregation, poverty and violence".

In reality, its objectives and intervention strategies remind us of those defined by Jaime Lerner (2006) for urban acupuncture; they pursued the regeneration of the social, urban and physical areas, reducing their vulnerability. They succeeded in integrating the areas in the urban fabric, increasing accessibility and even intervening in the territory itself when circumstances so require. In the same way we could say that the creation of these urban spaces are inspired by the Barcelona reno-

vation model (Monclús, 2003). However, it was undoubtedly the metro-cable that interconnected the PUI which also managed to eliminate ghettos and physical barriers within the urban fabric and became a fundamental piece of urban regeneration.

### 3.1 *The metro-cable*

The metro-cable is the cable transport system that is used in high mountain ports to move around the ski slopes. The application of its technology to the city of Medellín meant a simple, fast and efficient implementation and at the same time economic and sustainable. Simple and fast due to the ease of installation and the low level of alteration of the urban fabric. Since for its operation only needed to implant in the fabric a series of posters to which the cables will join through which the cabin will slide; although it was used to urbanize the streets where the line would run and provide them with equipment and natural trees (figure 1); as well as enabling some areas to locate the stations of entry and exit to the cable railway. Stations that were located in the most vulnerable areas, acting as catalysts of the regeneration process. Only 16 months were used for the construction of the first line.

It was effective because air transport eliminated the physical barriers caused by densification, the degradation of urbanization and the topography itself and managed to connect and integrate the obsolete and problematic areas of the city, also reducing the time to invest in the transfer. And economic because of the numerous benefits that offset their investment as well as the sustainability of the project, because in addition to helping to reduce CO2 emissions and the greenhouse gases produced by the old buses, this helped to finance part of the costs from the investment.

The first line (k) was set into operation in 2004 to connect two of the poorest communes of the municipality, Santa Cruz and Popular, with the first metro line that runs parallel to the Medellín River. These communes lacked the main infrastructures and of a minimum urbanization and they were located in an abrupt zone watered by numerous troughs, reason why their streets had a very high slope. Its weaving was the result of an "illegal occupation of lands with immigrants from the countryside to the city"; (Zapata, 2009).

The access and the circulation were quite complicated, as a consequence of the lack of urbanization and the own topography of the land, which made difficult the arrival of the traditional transport and

the connection with the metro-line. Circumstances that further emphasized the isolation and degradation of the areas leaving them imbued with poverty, unemployment and crime. They came to be considered the epicenter of the violence associated with drug traffic, when Medellín was described as the most violent city in the world in 1992.

The construction of the k line meant for the communes, a solution to the problem of transport, ease and speed of movement, interconnection with the rest of the city, and a definitive agent for its social reform. The metro-cable overcame the physical obstacles and became the directing vector of the first PUI, projects that built new public facilities in the obsolete zones, choosing for their location the same places where the metro-cable stations had been built, and contributing to the integration of the new transport system in the urban fabric. The ease of access and the rapidity of its movement meant that the two hours that the inhabitants initially took to get from the periphery to the center of the city would be reduced with its use to seven minutes. In addition, such its influence was on society that different studies corroborate that the inclusion of the metro-cable in the plot significantly reduced the number of homicides and the rate of violence was reduced by 79%, although in no case managed to eradicate crime.

The execution of the line cost 23 million dollars, a price that compared to other transport systems such as the underground, or the over-ground, was quite advantageous. It could also be said that it was economically profitable because of the supposed benefits that led to the local and private economy. The stations became meeting points and centers of regeneration that attracted the implantation of new equipment and businesses which positively influenced the economy, expanding the supply of employment and improving social cohesion. Commercial activity increased by 40%. Although it is true that no study has been carried out yet to measure the impact of the new commercial activity on the particular economy of households, or to explain whether unemployment rates were significantly reduced. However, it is also true that families reduced spending on locomotion systems by not having to pay for the use of different ways of transport to get to the center, and only having to pay the metro-cable ticket, which was also lower.

Thus the overcoming of the different altitudes of the land, together with the improvement of the urbanization of the own infrastructures, the availability of public transport on them, the repercussion on the economy and on the social transformations made a success of the project and soon it was set in operation, a second line interconnecting



**Figure 1:** The Metro.cable. Source: by Gacha187 [CC BY-SA 3.0], from Wikimedia Commons



**Figure 2:** Medellín: A Metro.cable in a slum. *Source: Max Pixel, CC0 Public Domain*

other communes, with somewhat higher income levels and a less abrupt topography, with the metro network. At present, three lines operate, the last one connected to a natural park through a station located in a marginal neighborhood

### 3. CONCLUSIONS

The urban regeneration proposed for the city of Medellín, from the realization of integral urban projects in the most depressed areas of the city and from the construction of the metro-cable as a new transportation system, It helped to alleviate the urban chaos in which the city had been plunged in the face of uncontrolled urban growth, the abandonment of the central areas and the disintegration and disconnection of the new peripheral territories with the rest of the city. The inclusion of the metro-cable as an urban trans-

port system meant overcoming physical barriers, overcoming the lack of urbanization in obsolete areas and its definitive integration into the city, ensuring mobility and social cohesion. The new transport system reached the most inaccessible areas and acted as a catalyst in urban regeneration, puncturing the most fragile points of the fabric to transform them into new public spaces endowed with all kinds of equipment that would contribute to the economic improvement of the area and social cohesion. Infrastructures and urbanization were improved, the interrelation of these areas with the rest of the urban fabric was achieved, the employment rate was increased and, consequently, delinquency and marginality decreased. Summarizing, recovering the words of Barton in 2008 regarding with what should be sustainability, Medellín had become an example of sustainable development and not only because of the very low impact that the new transport system has on the environment, but in what had been an integral improvement of the quality of human life



**Figure 3:** Medellín: A Metro.cable station under construction. *Source: By ALONSOZAR [CC BY-SA 4.0], from Wikimedia Commons*

and well-being in the daily space. Through the improvement of the public space in general and the new transportation system in particular, it's been taken place the long-awaited urban regeneration that had contributed to social integration and cohesion by lowering delinquency and marginality rates. So important and numerous were the benefits of the new transportation system that it was

quickly adopted by other cities in Colombia and Latin America such as Rio de Janeiro and Caracas. Innovations in mobility and climate change have classified it as one of the 100 resilient cities of 2016 (Zúñiga, Rodríguez, 2017). Medellín went from being one of the most dangerous cities in Colombia to an example of sustainability.

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