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Gustavo Fierro O., Gonzalo Hoyos B.*Faculty of Architecture and Design, Universidad de Las Américas**José Queri y Av. De los Granados, Quito 170513 – Ecuador**e-mail: gustavo.fierro@udla.edu.ec, gonzalo.hoyos.bucheli@udla.edu.ec***STUDY OF THE CORRIDOR URBAN FORM OF 10 DE AGOSTO AVENUE IN QUITO CITY – ECUADOR**

Abstract: *This article refers to the study of the urban form of an important piece of the macro centrality of the Metropolitan District of Quito (MDQ) in Ecuador, constituted by twenty-one neighborhoods located in east and west sides of the 10 de Agosto avenue. The study was carried out by means of field research and reviews of current regulatory instruments such as urban plans and ordinances, in order to reveal the general physical characteristics of spatial relationships between buildings, lots or plots, blocks and roads. It is aimed to offer a reading of the incidence of the urban form and its issues in the state of stratification and spatial segregation resulting from contradictions between urban centers and peripheries in Latin-American cities.*

Keywords: *urban morphology, urban centralities, Metropolitan District of Quito, 10 de Agosto Avenue, Latin American cities*

Background of the study

Over the past five years, the urban design workshops carried out by the senior levels of the recently created School of Architecture of the *Universidad de Las Américas* (UDLA), have developed urban design research and proposals for neighborhoods, parishes, and specific places in Quito as well as intermediate cities in Ecuador, which are generally done through inter- institutional agreements with municipalities. These academic exercises have been constituted as a methodological and theoretical-practical learning space of urban-architectural design in the context of the city project. This learning model has had a particular evolution. At the beginning, the urban proposal was appealing basically in the territorial context. With time, it has been structured more precisely as an urban design project. Since 2015, these workshops have been working on the study of the urban form for prescriptive purposes, and on formulation of architectural and urbanistic proposals¹. The workshops have been turned into spaces to reflect the city issues and virtues, as well as in the holistic and contextualized learning of architecture.

Between September 2017 and February 2018, the research team of the School of Architecture, got to know about the *International Seminar on Urban Form* (ISUF) with its *Urban Morphology* journal, whose editorial board is preceded by Jeremy Whitehand, head of the *Urban Morphology Research Group* (UMRG) at University of Birmingham, the main center in the United Kingdom for the historical-geographical study of urban forms. The work developed so far by the ISUF is an immense and invaluable source of learning in the field of urban morphology in the first world, and surely will enrich further studies on Latin American cities.

This article summarizes the findings of the research on the corridor urban form of *10 de Agosto Avenue*. The current research was carried out under the agreement between the *Instituto Metropolitano de Planificación Urbana* (IMPU) of the Municipality of Quito and the UDLA².

Some theoretical considerations

Two events have marked the genesis of the city and its evolution. The first one was the agricultural revolution: the birth of human settlements and the idea of the territory, the beginning

of the process of capital accumulation and the construction of class societies, the spatial organization of society and city-states. The second was the industrial revolution: the dizzying population concentration in the cities or urbanization, the explosion of the pre-industrial city or the rupture of the spatial limits of the traditionally compact city -which had identity and symbolism- to turn it into *urban* or the dispersed and diffuse space, which made the city and the urban space and its planning more complex.

The study of urban form dates back to the late 19th - early 20th centuries. It started in Europe, specifically in Germany, from geography and as the first approach to the study of the arrangement of physical phenomena on the surface of the earth, with an essentially qualitative approach and a strong emphasis on the origin of the form or morphogenesis (Hofmeister, 2003). This approach was based on the work of Otto Schlüter, who first introduced in 1899 the concept of cultural landscape *Kulturlandschaft* into geography, becoming the major defender of geography as a landscape science (Capel, 2002). Likewise, the work of F. Ratzel in 1903, motivated by the ideas of Darwin and the deterministic currents of the 19th century, reflected the interaction between geographical space and population (Heineberg, 2006).

As Villagrasa points out, in any case, the defining bases and the essential constitutive elements of the European urban morphology were established by Michel Robert Gunter Conzen, better known as M.R.G Conzen, a German geographer who migrated to Great Britain after the second postwar period, and is considered the father of the modern school of urban morphology, specifically because of his study of the English town of Alnwick published in 1960 (Villagrasa, 1991). The proposal of M.R.G. Conzen was based on two fundamental criteria: the genetic approach and the relevance of the plot as a unit of analysis of the city. Methodologically, he defined as the fundamental elements of the urban landscape: the plane of the city (defined by four components: site, road, plot and flat projection of the building), building types and land use. Since then, the study of urban form has received contributions from different disciplines or views, basically European and North American: historians, geographers, sociologists, urban planners and critics of modern urbanism (Conzen, 2005).

Regarding the three most important schools of urban morphology of the first world (English, Italian and French), Moudon argues that his studies start from the theoretical assumption that the city in general can be read or analyzed through its physical form. At the most elementary level, these analyses are based on three principles: “1. *Urban form is defined by three fundamental physical elements: buildings and their open spaces, plots or lots, and streets*”; “2. *Urban form can be understood as different levels of resolution. Commonly, four are recognized, corresponding to the building/lot, the street/block, the city, and the region*”; and, “3. *Urban form can only be understood historically since the elements of which it is comprised undergo continuous transformation and replacement*”. Furthermore, when the analysis aims at the construction of the theory of the city, the three schools show differences of purposes, each of them specifies their descriptive, explanatory and prescriptive intentions (Moudon, 1997).

In Latin America, many urban researchers use concepts and theoretical tools developed in the first world to explain its realities, without considering the socio-historical differences (Pradilla, 2012). In Ecuador, urban space thinking is fragmented and runs from partial, specific and exclusionary approaches, from different fields of thought and disciplines that do not reach the construction of an integrating vision of urban planning. Even though there is multidisciplinary and interdisciplinary empirical research of the city, it is not enough to formulate legitimate public policies with transforming capabilities of urban space.

In this context, the following question arises: Is it interesting to study the theories and the aims of the first-world urban morphology? The answer is yes. It is necessary to understand the accumulated knowledge on the subject, including one's own explanations about particular socio-economic processes that produce the form of our cities. In Latin American urbanism it is necessary to overcome the tensions between the socio-economic (extremely dominant in Latin America) and the traditional or exclusively physical explanation of the city (predominant in the

first world approaches). In the same way, it is important to assume a new *physicality*, one that points to the *DNA* of the city to the citizens, to seek its socio-spatial inclusion and to contribute the construction of the *right to the city*³.

In the context of the current thoughts about the city, in which partial and fragmentary approaches are interspersed -especially those that simply bet on *creativity* and *innovation*, new technologies and particular and specific conceptualizations- it is very timely to recover some theoretical aspects. Firstly, the city and the urban space are the product of the historical interaction of multiple factors and actors: social, economic, cultural and political. After all, as Lefebvre warned in *The Production of Space*: “*space is a social product*” and, therefore, “*each society produces a space, its space*”. Secondly, the study of the city is not possible apart from a social theory and as a material product, the urban space has: form, function and symbolism (Lefebvre and Lorea, 1974), (Castells, 1979). Thirdly, the study of the genesis and transformations of the city and therefore its planning, requires multidisciplinary and interdisciplinary contributions from geography, demography, history, sociology, economics, urbanism, architecture among others.

About the study area



Figure 1. Location of the study area

Urban projects in this corridor were already intuited and recommended by the territorial plans of the MDQ prior to 2016 due two decades of continuous process of urban deterioration. It covers an area of 1,095.65 ha (including the *Bicentenario* park); it is around 6% of the surface of the city, which currently has approximately 19,000 ha of the surface area. It is 7.8 km long and has 21 neighborhoods of the north-center of the city: *El Ejido*, *Larrea*, *Mariscal Sucre*, *La Colón*, *La Pradera*, *Santa Clara*, *Las Casas Bajo*, *República*, *Mariana de Jesús*, *La Carolina*, *Rumipamba*, *Iñaquito*, *Voz de los Andes*, *Jipijapa*, *Chaupicruz*, *Zaldumbide*, *Aviación Civil*, *Maldonado*, *Franklin Tello*, *Aeropuerto* and *Las Acacias* (Figure 2).

Research methodology

The identification of problems in the study area and the establishment of aims and strategies for the urban project were developed through the methodology of *Objectives Oriented Project Planning* -tree problems and tree of objectives and strategies- designed by the German cooperation agency *Gesellschaft für Internationale Zusammenarbeit* (GIZ). The following morphological aspects were investigated: physical environment and basic demography; streets and mobility; land use, housing and urban facilities; buildings and land occupation; and, finally, the built heritage. The sampling area for the investigation was defined for field research, in order

to analyze in detail, the relationship between buildings, parcels and streets. All the information was digitized in *Geographical Information Systems (GIS)*.

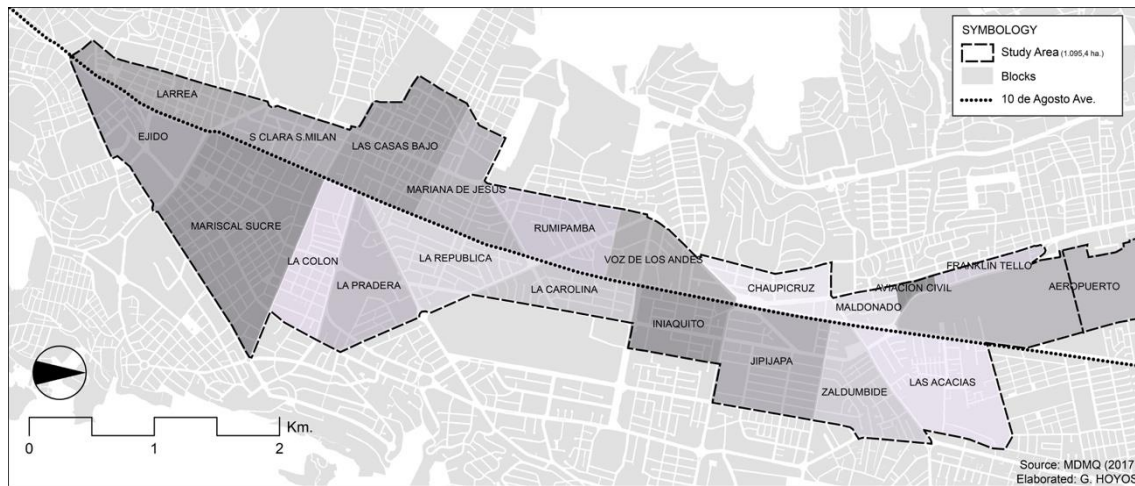


Figure 2. Study area and its neighborhoods

The current urban form

Physical environment and basic demography: The study area has relatively favorable conditions for urban development, the topography with slight variations of slope in the axis of *10 de Agosto* Avenue that oscillates between 1% and -1%, with average annual temperature of 14.7 °C, relative humidity, radiation, temperature, rainfall and favorable winds for human settlement and flood vulnerability relatively controlled since the construction of the project *Laderas del Pichincha* (1998-2002), which contained floods and runoff of mud that directly affected 90 neighborhoods settled on the slopes of the *Pichincha* volcano and consequently to the neighborhoods of the study area.

Since the 1970s, Quito has been decreasing the rate of population growth in its central area, due to population migration to the periphery or the valleys of the MDQ looking for housing and supposedly better environmental conditions for living stimulated for the real estate market. In 1980 its population density was 146.71 people/ha and in 2010 only 92 people/ha (Fierro, 2016).

The study area has suffered the same trend, decreasing its vitality as well as contributing to extensive and dispersed city growth (sprawl); in 1990 the area had 70,369 inhabitants; in 2001 64,361; in 2010 53,829 and by 2017 it is estimated that it would have reached about 46,884 inhabitants. If this trend continues, through 2040 it would have about 29,671 inhabitants, i.e. 30 people/ha (Figure 3 and 4).

Streets and mobility: The layout is basically irregular, as a result of at least three factors. First, most of the main roads that traverse the study area cross the layout designed by the *Jones Odriozola* Plan (1942- 1945). Second, there are lots or parcels with predominance of lots with areas greater than 1,000 square meters. Third, blocks of more than 10,000 square meters predominate (Figure 5). However, most of the roads have continuity which, in general terms facilitates an internal and external connectivity. In its streets there are very few blind walls, entry controls and/or chains that prevent the free movement of citizens. Most pedestrian routes from the *centroids* of the neighborhoods to the main roads -through which public transport circulates- occur in no more than 600 meters. The existence of some urban landmarks, especially towards *10 de Agosto* Avenue, favors the legibility of this urban piece.

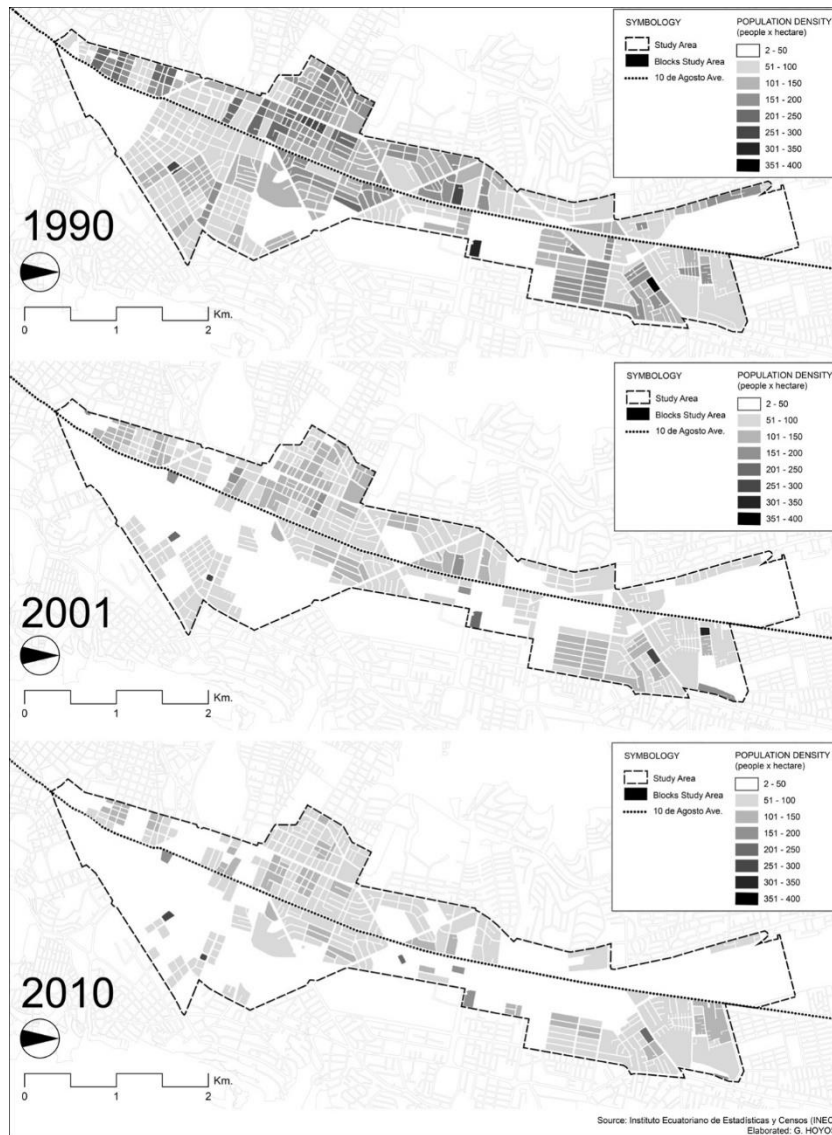


Figure 3. Decreasing of population in the study area

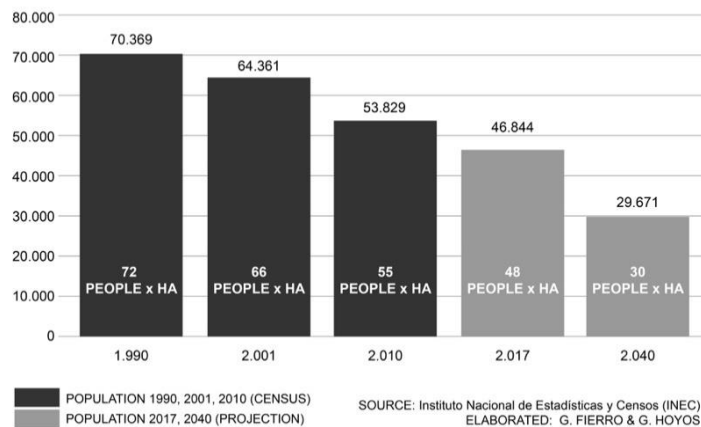


Figure 4. Decreasing of population in the study area

Sidewalks are in disrepair, do not have the normative dimensions that favor universal accessibility and its treatment is quite heterogeneous. They have become true labyrinths, as a result of the indiscriminate installation of kiosks and inadequate construction of vehicular ramps for front lots, the misuse of public spaces for informal sales and even advertisements of formal shops, installation of cairns to avoid the use of sidewalks and improper installation of traffic signs and advertising, etc. Overall, the current state of its sidewalks affect pedestrian mobility, reduces the possibility of social gatherings and the urban image deteriorates. In general, the infrastructure for bicycles is not enough articulated with the public transportation systems and the bicycle lanes have inappropriate dimensions. Inefficient circuits were detected, that increase travel time and finally, are unsafe as most of its routes must coexist with the circulation of cars. This fact does not stimulate increased travelling by bicycle. At the same time, it is evident that there are many lines for buses' circulation along *10 de Agosto* Avenue, and the number of bus stops is insufficient; which contrasts with the relatively efficient operation of the *Trolebús* system. The lack of public transportation routes in east-west sides of the Avenue and the jams caused by bus lines in parallel streets, respond to the economic interests of private bus companies rather than citizens' real needs. During rush hours, in the study area there is vehicular saturation with traffic jams, causing a car speed less than 9 km/hour. Additionally, it causes the vertiginous growth of the automotive park; the absence of a public policies in favor of pedestrian mobility, cycling and public transportation in the MDQ; inefficient automotive mobility of goods supply, and the indiscriminate use of streets as public parking, instead of more and better sidewalks for pedestrians.

Land use, housing and urban facilities: According to the prevailing land uses in the urban macro-centrality of MDQ, the general nature of parcels in the study area contains shops and urban facilities. In some parts of the neighborhoods and road corridors there is a strong tendency towards mono-functionality. This phenomenon would be the result of the one-sided decisions from owners and land speculators, causing that rent or land sale prices for commerce and services result higher than for housing use. The population in the study area has been rapidly decreasing in comparison with the number of dwellings⁴; accordingly, the average number of inhabitants per dwelling decreases: in 2017 it was 2.15, i.e. lower than in 2010, when it was 2.46; and, by 2040 it would be about 1.38. However, according to the buildable potential in compliance with the current *PUOS* land use plan, it is possible to build 39,080 new dwellings to accommodate 96,114 new inhabitants in the study area. The significant deficit of urban facilities at neighborhood scale (especially security, social welfare and culture) reveals clear spatial imbalances, social inequality, diminishing opportunities for social cohesion and the construction of communities and neighborhood identities. All these characteristics of the contemporary metropolis contribute to migration of people from the central city to the urban periphery.

In Quito city, the only spaces for civic, social, political and cultural expressions are located in the Historic Center area. As for the rest of the city, the urban development process of the study area did not provide these public spaces *per se*; the same trend takes place for neighborhood parks and urban green. The role of squares and parks, as places for social encounter, has been assumed for shopping centers⁵.

Buildings and land use: More than half of the lots has been occupied with buildings on the factory line or without setback, as a result of the match of two basic architectural-morphological patterns. The first one expresses the intention of continuity of land occupation on property line similar to the Historic Center, especially on *10 de Agosto* Avenue. The second corresponds to modern patterns of land occupation with setback, located mainly in the inner parts of the neighborhoods. The second pattern has resulted in a hybrid one that has occupied the front setback on the ground floor, another one on two floors -initially with covered parking partly or totally, for commercial use- and even, occupation of the lateral and posterior setbacks. The land has been overused, decreasing the surface of open ground that would significantly contribute to

environmental sustainability; more than 70% of the study area has been occupied with more than 100% of building coverage ratio (BCR) of the ground floor determined by the *PUOS* land use plan. However, in upper floors near 82% of the study area has not reached its total construction potential and 60% of this potential remains to be built. This situation is also expressed in the anarchic urban landscape from streets (Figure 6).



Figure 5. Size and form of blocks. Main block area in each neighborhood

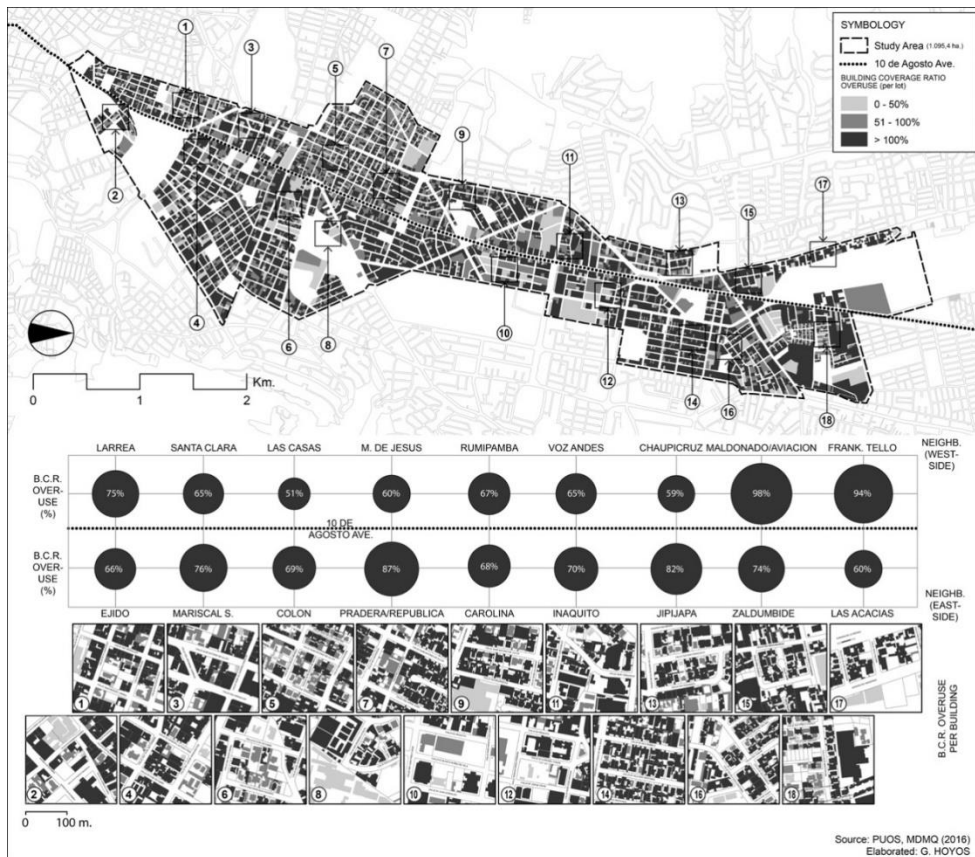


Figure 6. Building coverage ratio by lots and buildings

The built heritage: It is necessary to observe that the regulatory instruments for heritage protection from the Municipality have just included the Historic Center as *the heritage area* and also a large number of scattered buildings in the rest of the territory of the MDQ. It would be important to consider the expansion of urban heritage areas outside the Historic Center to ensure its protection (Hoyos, 2009), for example as in the study area, those located in *La Mariscal* neighborhood. The municipality has inventoried 341 historical buildings, 284 of them are in good condition. Nevertheless, there are still claims of abandonment and intentional destruction of the built heritage by their owners, trying to maximize the real estate profitability.

Conclusion

From the decade of the 1970s during the first Ecuadorian *oil bonanza*, Quito city has been experiencing an intense urban growth. In 1979 the urban area of the city and rural areas was 10,367 ha and in 2016 it reached about 43,000 ha. This means that in 37 years the urban area of the MDQ grew by 32,633 ha, with the growth rate of 882 ha per year (Fierro, 2016). This vertiginous urban growth has turned out into a diffuse city with sprawl towards to the periphery and to the surrounding valleys, generating dominant activity zones -centralities and micro-centralities- that have been consolidating as almost mono-functional spaces of urban facilities, services and commerce with decreased population density, that at least do not favor the vitality of the city accentuating the economic, social and cultural spatial segregation. Starting from this urban growth trend, the results of the research in *10 de Agosto* Avenue corridor is an important part of the so-called *macro-centrality* of the MDQ.

Most of the issues identified through this study are not only the result of the inorganic response of the local state to the vertiginous growth of the population and the consequent demand of urban land and housing, but also, the operation of a real estate market being more interested in getting the maximum profitability than in the environmental sustainability of the city. The functional urban sprawl, disconnection of services and functions, lack of urban facilities at the neighborhood level, conflicts of the mobility of people and goods, overuse of ground in the floor level and sub utilization of full constructible potential, which all together cause stratification and spatial segregation are reflected within their zones, parishes, neighborhoods and blocks of the MDQ.

Notes

1. In that year, in the framework of an interinstitutional agreement between UDLA and the Municipality of the *Cantón Francisco de Orellana* (also known as *El Coca*) an urban development project for the city was carried out. This project, which still has a certain flavor to territorial planning, revealed an interesting advance in the study of the relationships between the city layout, land use and the buildings. The research marked a starting point for the process of studying the urban form since an academic point of view.
2. The research was carried out and developed by the students of the ninth semester (*AR0960*) of the School of Architecture (2018-1), and directed by the workshop professors: Gonzalo Hoyos Bucheli, Gustavo Fierro Obando, Juan Toledo Hidalgo, Patricio Recalde Proaño, Raed Gindeya Muñoz. Technology and Environmental consultant professors: Jorge Reyes Alvear and Alexander Hickel Bravo.
3. Ecuador, 2008, *Constitución de la República del Ecuador*, Art. 3; UN, 2017, *New Urban Agenda*; Num. 11.
4. Even though, between 1990 and 2001 the dwelling stock increased from 20,954 to 22,027 units, in 2010 it experienced a slight decrease, it was 21,887 units. If the trend continues, by 2017 it would have been 21,779 and by 2040 it would be 21,427 dwelling units.
5. In the citizen's imaginary, only *Plaza de las Américas* and *Plaza Foch*, which has become leisure centers with concentration of restaurants, are the only *Plazas* that exist in the north of Quito city.

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