

## (IR)REGULARITY: PATTERNS OF URBAN GROWTH IN BRASÍLIA'S SATELLITE CITIES - THE CASE OF SOBRADINHO II

Patricia Martins Assrey MSc, Universidade de Brasília, Brazil

Valério Augusto Soares de Medeiros PhD, Universidade de Brasília, Brazil

---

### ABSTRACT

*This paper aims to evaluate urban structures which are the result of both State and private sector actions in Brasília, capital of Brazil. Brasília, a planned city inaugurated in 1960, has been growing at an accelerated pace since its construction. This led to the early emergence of so-called satellite cities, urban structures without political autonomy and dependent on a center, the Plano Piloto designed by Lucio Costa. In addition to the satellite cities, which are a result of governmental actions, there are also illegal districts, irregular parcels of land that are the result of the action of private agents who work on the city's surroundings and have profit as a main purpose. The study seeks to understand the morphological patterns generated by such actions as well as their consequences for urban space, based on three categories of analysis: road network, accessibility, land use. The results obtained lead us to believe that the juxtaposition of the urban tissues resulting from these actions generate conflicts of various types, besides spatial segregation. The study focuses on the satellite city of Sobradinho II, located north from Brasília's city center. Sobradinho II has its own center, designed by the State in addition to various illegal parcels developed by private agents. Keywords: urban patterns, satellite cities, illegal settlements*

---

### INTRODUCTION

This paper aims to evaluate urban structures in the Federal District of Brazil – DF, developed by both the State and private agents, namely landowners that act as real estate developers. Our assessment tries to understand the occupation patterns generated from such actions as well as their consequences for the city, especially considering the road network, accessibility and land use. The focus of the study is the satellite city of Sobradinho II, which was originally part of another satellite city (Sobradinho I) and where most of the allotments are illegal.

---

### BACKGROUND

It is impossible to dissociate the history of Brasília from the history of its satellite cities. Even before Brasília's inauguration, there were already eight satellite cities in the surrounding area. Such places were designed to relocate and shelter residents of precarious settlements, people who worked in the construction of the new capital. Brasília's creator, Lucio Costa, had predicted the emergence of satellite cities as urban developments after the consolidation of *Plano Piloto*, but their premature emergence was a consequence of the construction workers choosing to remain in the city (Costa, 1974). Since the purpose of the city was to house the administrative body of the Federal Government, the urban design did not anticipate housing for such population, and the creation of new urban centers was the quickest solution to contain the growth of slums.

The first satellite cities had their original design approved in full by the municipality, followed by additions (such as new lots) and modifications (new urban parameters, for instance). The approval and implementation of the design was followed by the transfer of the occupants of the precarious settlements to the new lots. It so happens that, since urban legislation issued in 1992 (*Plano Diretor*

de Ordenamento Territorial – PDOT), the Government of the Federal District – GDF, gave up on its exclusive attribution of land parceling, allowing private individuals to exercise this function. Since then, there has been a huge expansion of urbanized area and the consequent incidence of illegal allotments, especially southeast and northeast of *Plano Piloto* - where Sobradinho II is located. More recently, the creation of satellite cities has served the purpose of landholding regularization. In these cases, there is no original design, but the implementation of some strategies for creating better conditions in areas that are often already consolidated.

It is important to point out that such expansion is happening fast and despite State's action. There are 347 illegal allotments in the Federal District, which house more than 530.000 people, about 22% of the population living in the FD (SEDUH, 2006). In other words, a relevant part of the population of Brasília lives in an illegal situation, in places whose spatial guidelines are not determined by criteria such as quality, performance and functionality, but instead based on a market logic (Lefebvre, 2004).

It is in this context that we question ourselves about possible occupation patterns in the Federal District, consequence of the various agents that act over the urban space. What types of patterns can be found in the existing allotments in DF? What are the characteristics of the allotments designed by the State and by private agents in terms of quality of the built environment? Would it be possible to relate the action of a specific agent to a characteristic morphological result?

We start with a brief history of the occupation of the northeastern axis of DF, where Sobradinho and Sobradinho II are located, among other satellite cities. Next, the three analysis parameters are presented, along with the obtained results (considering both the legal and those of illegal occupation in Sobradinho II). Finally, we propose a brief discussion on the results obtained, to determine differences and similarities between the assessed urban fabrics, as well as the implications of these spatial results for the city.

---

## METHODOLOGY

We propose a research that lends itself much more to qualitative recognition (what patterns can be found) than quantitative (how many and where are they) of the studied areas. In terms of methodology, the paper is based on two fronts: one of documentary research, with the objective of raising legal and chronological aspects of urban development of Sobradinho II; the other is mainly morphological. Both the existing allotments in the eleven regularization areas - AR of Sobradinho II and the initial urban core, designed by GDF, were evaluated from three categories of analysis: road network; accessibility; land use.

The assessment of aspects related to the road network and accessibility is based on Gondim (2014). According to the author, road networks can follow regular or irregular patterns, making it possible for both to coexist in the same urban center. The most common configurations of regular patterns are radial, linear, organic, or grid. Such patterns can still be perfect (when there is geometric precision) or imperfect, when it is possible to identify the pattern, even if there is no precision in the design. In addition, road networks can be part of closed systems (boundaries demarcated by physical barriers and access control) or open systems. Regarding accessibility, Gondim (2014) describes five indicators that would determine it: availability (adequate space for passage of transport modes); linearity (the best way is the most direct and shortest); continuity (the fewer obstacles, the greater the fluidity to reach the destination); permeability (connectivity in the

road system, in order to avoid negative routes) and legibility (ease of identification of the network configuration).

The analysis of land use is based on land tax (*Imposto Predial e Territorial Urbano – IPTU*) data from the DF Treasury Office. The assessment of land use is based on local legislation (Decree n°. 37,966/2017), which classifies land use and urban activities within the limits of the DF. However, it is important to note that the vast majority of the lots in the area are located in irregular allotments; that is, the verified urban activities are not part of a planning logic determined by the State, but by the population itself.

We understand that a coherent assessment of the morphological aspects of the regularization areas in Sobradinho II must consider the fact that each AR is composed of several allotments, juxtaposed and built at different time frames. Thus, we recognize that the morphological analysis of these areas should not be restricted to the observation of regularization areas as a whole, also considering the allotments that compose them as independent entities, since the sum of these occupations is what leads to the current form of occupation.

---

## FINDINGS

To talk about Sobradinho II, we need to talk about Sobradinho I beforehand. The construction of Sobradinho I started in 1958, in an effort to house, on an emergency basis, part of the poor population that migrated to Brasília, as well as government employees with no forecast of allocation in Plano Piloto (Costa, 2011). The satellite city went through various expansions, one of them being a new sector, called Setor Oeste (western sector). Over time, the expansion of Setor Oeste became a new satellite city on its own, Sobradinho II, which was officially inaugurated on 2004.

The legal area of Sobradinho II is composed of two sections, correspondent to two different master plans from the 1990's: URB 19/90 (north of the area) and URB 43/92 (south of the area). Subsequently came URB 23/95 (creation of *Avenida Central*) and URB 134/98 (new lots south of the city). Finally, URB 35/2009 (inclusion of a lot for a rural education) and URB 120/2017 (inclusion of a bus central station) were added. So, we have that the entire original urban area of Sobradinho II was designed and implemented between 1990 and 2017, according to six urban projects.

In addition to that, the urban area of Sobradinho II is composed of 11 Regularization Areas – AR, which consist of illegal settlements that are in the juridical process of becoming legal. These are commonly land fractions of originally rural plots that were fractioned and negotiated by their owners or *grileiros* (land invaders or deed-falsifiers). The AR are subdivided into several allotments of different sizes and characteristics, with regard to street layout, batch dimensions, building quality and number of residents. There are in total 13,382 lots in this situation, which is a lot, if compared to the 4,851 existents in the legal area. But it should be noted that even in the “legal area” there is illegally occupied land: 528 of the 4,851 mentioned lots are going through regularization process.



**Figure 1:** Sobradinho appears in orange, while the expansion of Setor Oeste is marked in green. It is easy to perceive speed of consolidation of illegal settlements. Source: own authorship over orthophotographs.

The analysis of URB 19/90 and URB 43/92 shows that both were designed without taking the other into account; the area concerned by URB19 / 90 is not included in URB 43/92 and vice versa. Each project determines a specific road mesh pattern: the first results in a regular grid in squares that are sometimes perfect, sometimes imperfect; the second defines a regular mesh that we understand as radial. Both projects specify an empty area at their center, with no destination and which would only be split in subsequent projects. The limits are open in both cases.

The partition based on URB 19/90 shows better accessibility performance than that based on URB 43/92. There is greater linearity and continuity, which guarantees better permeability through the area. The radial pattern observed in the southern portion of Sobradinho II is very truncated and with many interruptions, which leads pedestrians to travel negative paths to reach their destination.

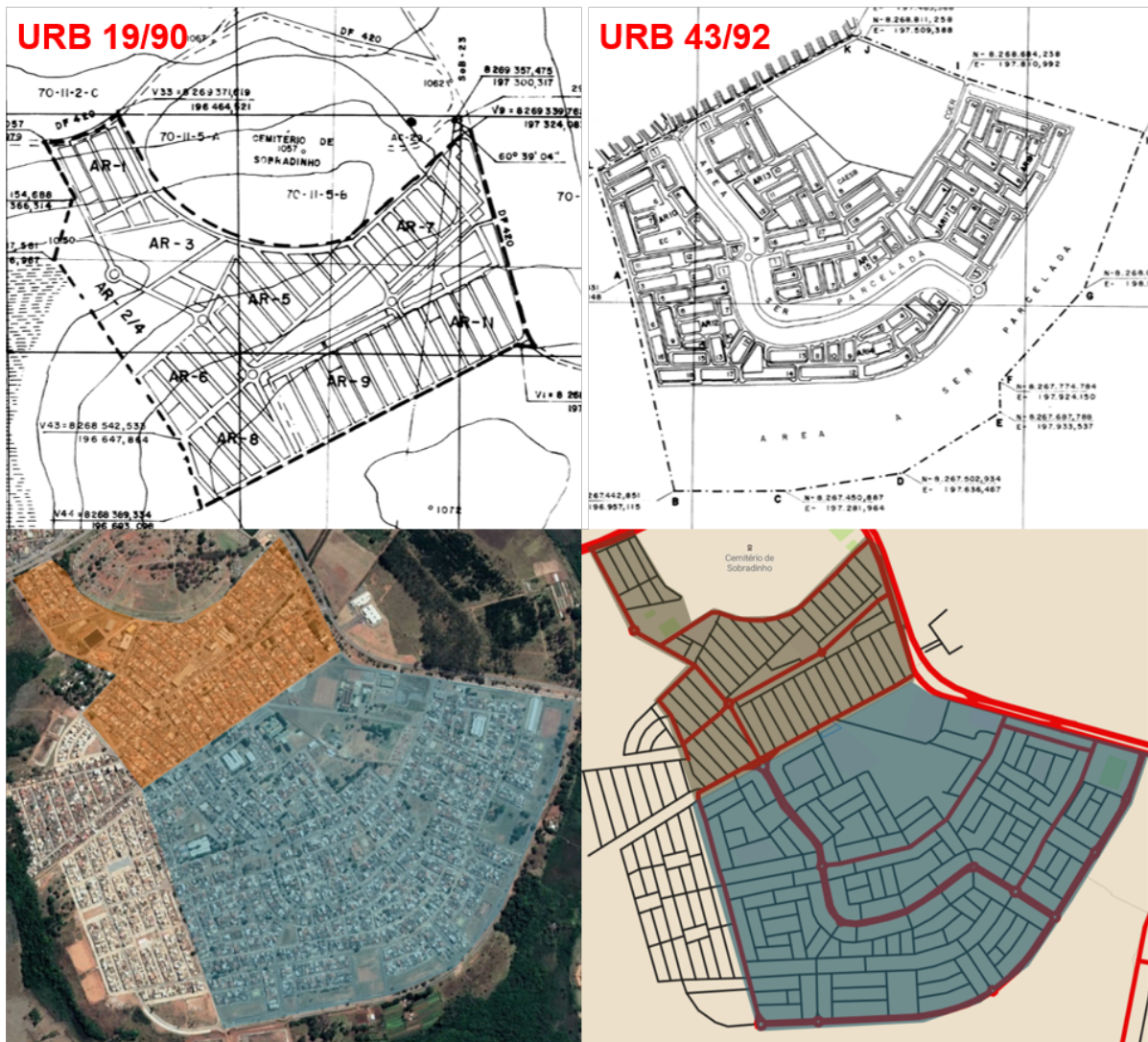


Figure 2: The legal Sobradinho II. In the northern portion, the area defined by URB 19/90. In the lower portion, the area defined by URB 43/92. Source: Own authorship over Google Earth and Mapbox.

On a larger scale, the juxtaposition of the two projects generates serious consequences in terms of circulation. It was found that *Avenida Central* is the only connection between the two sections (and it was not foreseen by either of the initial projects). In addition, the road that separates the partitions did not have its parameters determined by either of the projects, having appeared for the first time only in URB 23/95. To the north, the road is bordered along its entire length by single-family residential lots; to the south, there are some shops, parking lots and a large empty area, where the regional municipality of Sobradinho II is located. As a result, internal accessibility in the sector has a low performance in terms of permeability, connectivity and linearity.

Regarding the irregular allotments, there is a prevalence of regular patterns, both perfect and imperfect, in squares. On a smaller scale, there is also the incidence of regular linear and organic patterns. The blocks resulting from the existing road networks do not follow specific dimensions, with both short blocks less than 100 meters in length and very elongated blocks, which exceed 400 meters. In addition, such blocks do not follow a pattern that spreads across the AR as a whole; their form are restricted to the allotments themselves.



**Figure 3: Road networks found in the AR of Sobradinho II. Source: own authorship over Google Earth and Mapbox.**

About accessibility, we observed that the limits of allotments in the AR play an extremely important role. They are closed by walls, fences and railings, with access control in almost their entirety. There are several occurrences of juxtaposed allotments that, at first glance, seem to have road connections between them but, in fact, have no connection, since they are surrounded by physical barriers.



**Figure 4: Closed boundaries of the allotments located in the same AR compromise accessibility in apparently homogeneous urban fabric. Source: Own authorship over Google Earth and Mapbox.**

Regarding land use, it should be noted that the vast majority of the lots are intended for single-family housing. There are few intended for commercial use and the existing institutional lots are intended for education (6 public schools and 6 private schools), health (an Emergency Care Unit - UPA and a health clinic, both public) and public safety (police station).

Also, in the AR, there is a massive predominance of lots intended for single-family housing. We verified some cases of commercial use, generally close to the allotments 'access roads, and a few institutional and leisure lots, mostly inserted in closed allotments with controlled access.

It is important to note that the evaluation of URB 19/90 and URB 43/92 shows that 85% of the lots in the first and almost 72% of those in the second are intended for single-family housing. Although the formation process of settlements in the AR is different, the proportions between lots aimed at single-family housing and other activities is similar to that found in the legal Sobradinho II. Thus, these are urbanized areas of great proportions and underused land.

It is safe to say that the analysis of land use shows a great focus on low performance parameters both in areas planned by the State and in the AR. On one

hand, this makes the occupation of settlements easier and faster, especially if we consider the initial purpose for the sector (low-income housing). However, it also shows the perpetuation of a model based on segregation and individualism, in addition to demonstrating the low performance of the sector in terms of density and efficiency of land use, which leads to greater expenditure on basic infrastructure and transport networks, among other impacts (Acioly and Davidson, 1998).

---

## CONCLUSIONS

The data collected demonstrate, first of all, the gap between state planning and city demand, which is growing at a much faster pace than traditional mechanisms of access to land allow to monitor. The population's response to this gap occurs in the form of illegal settlements. We observed that such settlements take place in a completely disconnected manner, both in terms of form and in relation to the needs of the area as a whole. Nevertheless, we cannot say that this fact is the prerogative of private individuals; the areas developed by the State for the original urban center of Sobradinho II also have this characteristic.

If it is possible to describe an aspect necessarily linked to the actions of each of the agents, it is the limits of the allotments. The State has no reason to enclose public roads, while private agents value their undertakings by making them fortified enclaves (Caldeira, 1997). Even if there were no physical barriers between the AR, the great diversity of road networks would make accessibility between allotments very difficult.

The present study demonstrates that, in the case of Sobradinho II, the development of urbanized areas has been carried out from the juxtaposition of disconnected urban fabrics, through road networks of different patterns. Such variety leads to low performance in terms of accessibility. It is interesting to note that, although the State and private individuals have different interests to look after (social function of urban property x market logic) the spatial result of their actions ends up being quite similar. The absence of holistic thinking in the planning process seems to be linked to both the actions of private agents and the State.

We understand that the work has its limitations both in terms of clipping (a satellite city among the thirty-three existing in DF) and also of analysis, since few aspects were evaluated. Notwithstanding, the study unveils characteristics little observed in the areas of regularization and the spatial result of private individuals' actions over the urban fabric. We believe that the focus on such areas and the evaluation of their morphological aspects are crucial from the understanding of how the transforming agents of space perform this function.

---

## REFERENCES

Acioly, C.; Davidson, F. (1998) *Densidade urbana: um instrumento de planejamento e gestão urbana* (Mauad, Rio de Janeiro)

Brazil (1964). *Lei Federal n° 4,545 de 10 de dezembro de 1964*. (Brasília).

Caldeira, T. P. R. (1997) 'Enclaves fortificados: A nova segregação urbana' *Revista Novos Estudos* (n° 47, pp. 127-154).

Codeplan (2018). *Estudo urbano ambiental Sobradinho II*. (<http://www.codeplan.df.gov.br/wp-content/uploads/2018/02/Estudo-Urbano-Ambiental-Sobradinho-II.pdf>). Accessed June 29th 2020.

Costa, G. G. (2011) *Regiões administrativas do Distrito Federal de 1960 a 2011* (Doctoral Thesis, Universidade de Brasília).

Costa, Lucio. 'Considerações em torno do Plano Piloto de Brasília', *A invenção da Superquadra*. (IPHAN, Brasília).

Distrito Federal (1989). *Decreto n° 11.921 de 25 de outubro de 1989* (Brasília).

Distrito Federal (1992). *Lei n° 353 de 18 de novembro de 1992* (Brasília).

Distrito Federal (2009). *Documento Técnico do PDOT* (Brasília).

Distrito Federal (2012). *Lei Complementar n° 854 de 15 de outubro de 2012* (Brasília).

Distrito Federal (2017). *Decreto n° 37.966 de 21 de janeiro de 2017* (Brasília).

Gondim, M. F. (2014) *A travessia no tempo: homens e veículos, da mitologia aos tempos modernos* (Doctoral Thesis, Universidade de Brasília).

IPDF (1990). *Projeto para a expansão urbana do Setor Oeste de Sobradinho* (Brasília).

IPDF (1992). *Projeto para a expansão urbana do Setor Oeste de Sobradinho* (Brasília).

IPDF (1995). *Projeto para o parcelamento da Avenida Central da expansão urbana do Setor Oeste de Sobradinho* (Brasília).

IPDF (1998). *Projeto de parcelamento para a expansão urbana do Setor Oeste de Sobradinho*.

Lefebvre, H. (2004) *The Urban Revolution* (UFMG, Belo Horizonte).

Medeiros, V. A. S. (2013) *Urbis Brasiliae: o labirinto das cidades brasileiras* (Universidade de Brasília, Brasília).

Panerai, P. (2014) *Análise urbana* (Universidade de Brasília, Brasília).

Seduh (2006). *Diagnóstico Preliminar dos Parcelamentos Urbanos Informais no Distrito Federal* (Brasília).

---

#### CORRESPONDING AUTHOR

Patricia Martins Assreuy, MSc, Einbecker Straße 101, Berlin, 10315, Deutschland.  
patricia.assreuy@gmail.com