

Dynamics of Urban Mutations in the Metropolitan Region of Campinas: Impacts on Suburban Areas

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Abstract. Urban change in modern cities, particularly in large urban centers, is a complex process influenced by demographic shifts, occupational dynamics, and spatial interactions. Unfortunately, these changes often result in spatial segregation and prioritize privatization, as seen in the proliferation of shopping malls and gated communities. This study focuses on the metropolitan area of Campinas, a significant economic hub in São Paulo, and its impact on the surrounding urban areas. We examine the impact of these changes on the surrounding suburban areas, with a particular focus on the region's road network and its role in urban development. Furthermore, we investigate the connections between the central urban core and its peripheral extensions. Through an analysis of the dynamics of urban expansion, spatial integration, and fragmentation, we provide insights into the changing urban landscape and its socio-economic implications. Our research aims to inform policy decisions and promote sustainable urban development strategies.

Keywords. Highways, Suburban Spaces, Urban Mutation, Spatial Segregation, Peri-Urban Space

1. Introduction

Although the city of Campinas preserves its original urban grid, its growth has been driven by generic forms of urbanization, such as shopping malls, gated communities, and subdivisions on the side of highways. The lack of effective metropolitan management exacerbates these dilemmas, especially in a fragmented metropolitan region such as Campinas. The dynamics and dilemmas include the predominance of individual transport, the emergence of fortified enclaves, the privatization of public space, the decline of the urban center, increased spatial segregation, and the uncontrolled expansion of urban areas over rural areas. These challenges reflect issues of urban planning, security, cultural identity, and environmental sustainability (Turczyn, et al, 2018).

The impact of urban change on the dormitory cities or satellite cities, which are historically linked to the dynamics and relationships that occurred in the center of Campinas and which make up its metropolitan region, despite having been built even before the term urban mutations was coined, it is crucial to analyze how these two phenomena - that of the dormitory city and that of urban mutations - relate to each other at present. These cities have a history of commercial, social, and cultural

interactions with the big center. It is necessary to analyze how the dormitory towns and the peri-urban space have, in turn, dealt with the changes resulting from the urban mutations, i.e. the creation of large shopping malls, large private condominiums, and, consequently, the decline of the region's main urban center (Ojima, R.; Hogan, D, 2008; Caldeira, T. P. D. R, 2000).

2. The Metropolitan Region of Campinas (RMC)

2.1 Historical Background

The city of Campinas originated from a town that was established around 1720. At that time, Bandeirantes were capturing indigenous people and exploring areas suitable for mining in the interior of what is now the state of Minas Gerais. They followed the indigenous paths that led to the interior of the continent and discovered a large clearing in the middle of dense Atlantic forest along the Guaiases' route from São Paulo towards the state of Goiás. This clearing made it easier to set up settlements and houses later on. In 1745, the district was named Campinas do Mato Grosso, and in 1797, it was renamed Vila de São Carlos. The region gradually gained influence in sugar cane production and accumulated wealth. In 1842, the town was elevated

to a city, and sugar production was replaced by coffee production. With the new economy based on coffee production, Campinas became one of the wealthiest and most influential areas in the region. The black population, who were enslaved, constituted the primary labor force for planting, cultivating, harvesting, processing sugar cane, and performing other related activities such as separating grains and bagging. The end of the 19th century and the beginning of the 20th century marked Campinas' urban revolution during the coffee cycle. The surplus from this production enabled investments in railroads, public infrastructure, utilities, storage, and communication systems (Lapa, J. R. A., 2008).

2.2 Formation of the Metropolitan Region of Campinas (RMC)

The formation of the Metropolitan Region of Campinas (RMC) was established following the Constitution of the state of São Paulo. In Brazil, metropolitan regions are defined by the Brazilian Institute of Geography and Statistics (IBGE) as groups of adjacent municipalities established by state legislation. The 1988 Constitution delegated the power to create them to integrate public functions of common interest to the states. However, the creation of municipalities is often motivated by political-administrative interests, to access federal resources. Metropolitan regions vary significantly in population size and number of municipalities, resulting in disparities that lead to a lack of integration and heterogeneity between them.

Complementary Law No. 870 of June 19, 2000, established the MRC, initially made up of 19 municipalities and later expanded to 20 municipalities. The region is made up of Americana, Artur Nogueira, Campinas, Cosmópolis, Engenheiro Coelho, Holambra, Hortolândia, Indaiatuba, Itatiba, Jaguariúna, Monte Mor, Nova Odessa, Paulínia, Pedreira, Santa Bárbara d'Oeste, Santo Antônio de Posse, Sumaré, Valinhos, Vinhedo and, later, Morungaba (Gonçalves Junior, F. A., & Corrêa, T. C., 2013).



Fig. 1- The integration possibilities in the RM of Campinas and the spatial processes of conurbation. Source: Moreira, Jr. (2016). Adapted by the author.

The Metropolitan Region of Campinas is known for its economic dynamism and its municipalities have

varying population sizes, centered on a main city and other cities of different sizes. It generates significant income through its economic activities and the surrounding region, resulting in the highest GDP per capita among Brazilian metropolises. Since the 1970s, urbanization has been dispersed, with industries specializing in different locations along the highway.

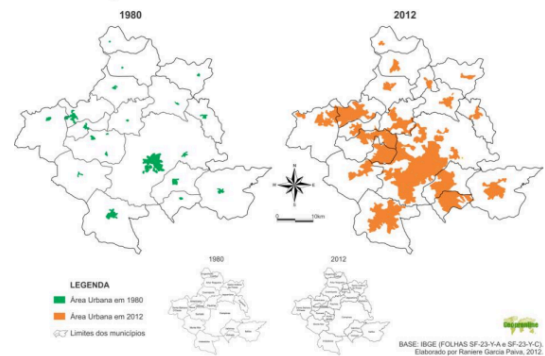


Fig. 2 - Urban evolution in the metropolitan region of Campinas: from 1980 to 2012.

3. The Road Routes

A complex urban and regional arrangement can be observed in Campinas, characterized by a network of connections among various agents and cities within a heterogeneous territory. This network is linked by an extensive highway system that its creation coincided with industrial changes and shifts in the international division of labor.

The Anhanguera highway has almost continuous urbanization around it, while the Bandeirantes highway is marked by spatial isolation and voids. On the other hand, the Dom Pedro I highway is characterized by open areas and scattered occupations and is one of the region's main vectors of economic development (Gonçalves Junior, F. A., & Corrêa, T. C., 2013).

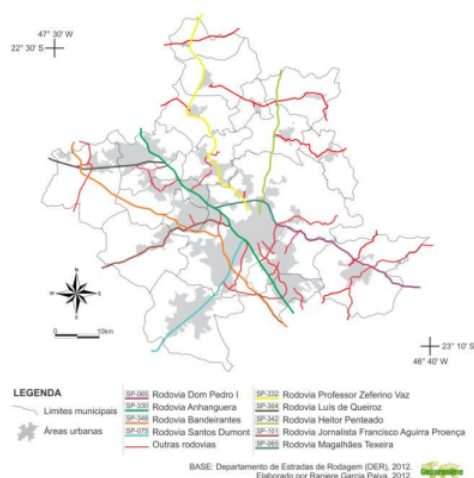


Fig. 3 -Map of the road system in the metropolitan region of Campinas.

Internal differences and contradictions within this region are evident. Low-income populations are

concentrated in areas surrounding the highways, while the affluent reside in what is known as the 'mountain range of wealth.' The metropolitan region of Campinas was created in the 2000s as a result of debates sparked by the expansion of the Dom Pedro I highway and intense urbanization between 1900 and 2000 (Turczyn, 2018).

The metropolization process in Campinas resulted from the industrial deconcentration of the capital and neighboring cities. This was facilitated by the city's proximity to the capital and the regional road system. The Anhanguera Vector played a key role in the deconcentration of industries in Campinas, leading to the development of new working-class neighborhoods and housing. Evidence of this can be seen in the prevalence of industrial warehouses along the Dom Pedro I highway.

Currently, the Dom Pedro I highway plays a crucial role in a system that surrounds the metropolitan region of São Paulo, connecting three metropolitan regions and contributing to the context of globalization and market-oriented development. The territory is focused on state planning in collaboration with the private sector. It is a unique arrangement in Brazil characterized by units that concentrate on population, economic and social relevance, as well as scientific and technological infrastructure (Turczyn, et al, 2018).

3.1 The metropolis' fragmented growth

Since the railroad's arrival in Campinas, the city has been divided into two areas: one occupied by working-class neighborhoods and the other by the coffee-growing elite. The working class initially settled in Vila Industrial neighbourhood, on the opposite side of the tracks, by occupying undervalued land.

Intense urbanization since the 1950s has led to the occupation of previously inaccessible areas and the emergence of distant neighborhoods, which has encouraged and facilitated the use of cars. The construction of the Anhanguera highway during this period was a crucial factor in the city's development.

The phenomenon of dispersed urbanization is spreading to rural areas, leaving significant unbuilt spaces between new urban centers. This lack of direct physical connections exacerbates spatial and social segregation, hindering the low-income population's access to urban services and infrastructure. In essence, high-income neighborhoods tend to cluster in the same area of the city where infrastructure investments are concentrated (Caldeira, T. P. D. R., 2000; Coelho, L., 2015; Almeida, J. G. R., 2023).

Furthermore, urban legislation from this period onward was developed with active participation from the real estate market and influential individuals.

4. Suburban Areas at RMC

4.1 Peri-Urban Space

The Campinas metropolitan region has a population of around 3.2 million inhabitants. The region operates within a robust economic structure, where the surrounding cities play different roles in a regional dynamic. The diagram below illustrates that urban areas in the region are distributed in a dispersed pattern, similar to that of a galaxy.

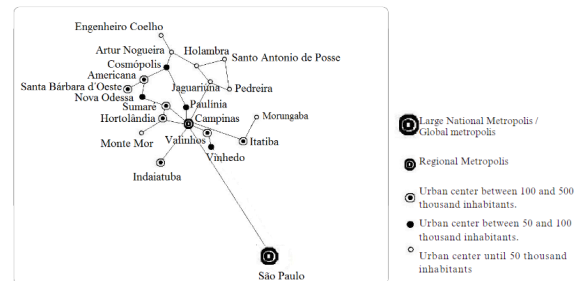


Fig. 4 - Composition of Urban Network. Source: Moreira, Jr. (2016). Adapted by the author.

Americana, Indaiatuba, and Santa Bárbara d'Oeste form an important urban corridor connected to Campinas. This region is known for its economic significance. The cities are part of a conurbation, with Indaiatuba standing out due to its industrial presence, large population, and strategic connection to Viracopos International Airport. The urban corridor stretches from Vinhedo to Nova Odessa along the Via Anhanguera, representing the region's primary population and economic axis. Additionally, there are small towns, such as Cosmópolis, Artur Nogueira, and Engenheiro Coelho, that preserve rural characteristics while maintaining a strong connection with Campinas.

According to Coelho (2015), dispersed urbanization refers to the creation of gaps in the built-up areas of the territory, maintaining empty spaces between continuous urban nuclei. In contrast, fragmented urbanization is characterized by the generation of contrasts in the urban fabric due to the non-occupation of certain areas for a period of time. Both concepts are used together in studies of the Campinas Metropolitan Region (MRC), as they occur simultaneously and complement each other. Dispersed urban centers can expand in a fragmented manner and connect to other adjacent centers or the contiguous metropolitan area, often overlapping (Ojima, R.; Hogan, D., 2008).

The dispersed urbanization in the region, as discussed by Almeida (2023), highlights the fragmentation of urban expansion over non-urbanized territory. This increases the spatial segregation of urban functions and the formation of new centralities linked to the globalized economy.

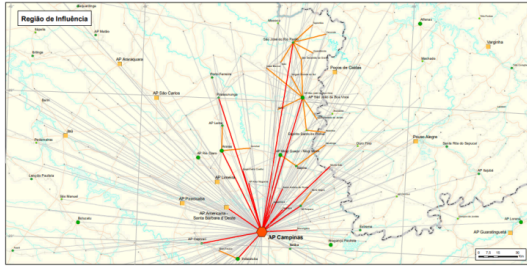


Fig. 5 - Campinas' Influence on Nearby Cities. Source: IBGE, 2020.

4.2 Segregated Areas

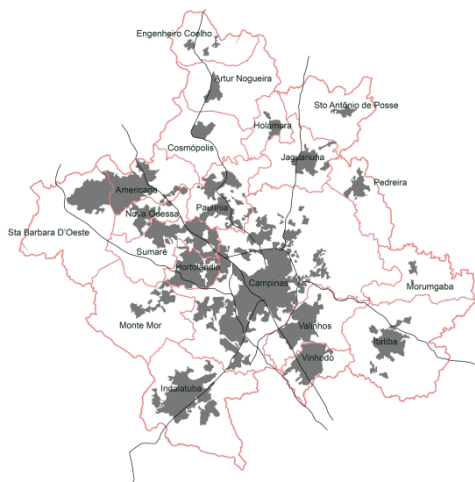


Figura 2. Região Metropolitana de Campinas com manchas urbanas e sistema rodoviário. Fonte: Agemcamp, editado pelo autor, 2022.

Fig. 6- The metropolitan region of Campinas, urban areas, and a road system. Source: Almeida (2023)

The condos and plots are mainly located in the northeast, east, and southeast, near neighboring municipalities and the Dom Pedro I highway. Almeida (2023) describes this area as a 'wealth mountain range'. This type of organization results in segregation, not only due to real estate speculation but also due to state housing planning. For example, COHAB (Metropolitan Housing Company) established housing estates on the merges of the Anhanguera highway, far from the city center and urban infrastructure facilities.

These housing estates are isolated from the traditional urban fabric, such as those located in the far northwest near the borders with Sumaré and Hortolândia. There are precarious settlements, occupations in permanent protection areas, and small housing estates from different eras (Almeida, J. G. R., 2023).

Around Rodovia Dom Pedro I, there has been a decrease in housing estates for social housing, while middle and upper-class areas are concentrated in gated communities. The "favela" was urbanized and delivered in 2011.

In Sousas, an area where upper-class condominiums are concentrated, the Santana and Jardim Conceição complexes stand out. Legislation and the Master

Plan are crucial in the territorial planning of Campinas (Suarez, P. S. M., 2014).

5. The Urban Mutations

5.1 Definição

Solà-Morales (2002) does not provide a clear description of the forms of urban mutations but implicitly suggests that these mutations are the formal results of the interaction of the other categories. It is important to emphasize, as the author notes, that the proposed categories do not form a closed and complete system of urban analysis, but rather a fertile and open system for new experimentation and applications.

5.2 Shopping Malls

The Dom Pedro Axis region is dominated by large-scale equipment and agents, influenced by the technical-scientific-informational environment. This has resulted in a diminished role for citizens. Neighborhoods and districts are no longer just parts of the city but are now part of the metropolitan region. Roadside shopping centers are symbols of the dispersion of centrality and consumption, contributing to the formation of new neighborhoods, including gated communities. In addition to shopping centers, these establishments offer a variety of services and recreational facilities, making them destinations for both consumption and entertainment. The location of the area along the Dom Pedro I Highway is strategically positioned, reflecting global urbanization patterns and contributing to the metropolitanization of the region. The shopping centers, specifically Iguatemi, Galleria, and Parque Dom Pedro, have had a significant impact on the urban development in their vicinity, altering consumption and commuting patterns. The expansion of these developments has brought about significant changes in the urban structure, including the creation of new avenues and viaducts, which have impacted not only the immediate surroundings but the entire city. The malls cater to various social segments and impact consumption and commuting patterns in the region, they play a crucial role (Turczyn, et al, 2018).

5.3 Private Condominiums

The presence of condominiums and gated subdivisions in the Campinas region, especially around the Dom Pedro highway, is a striking feature of the urban landscape, reflecting a city in expansion. This form of occupation of space, predominantly by high-income classes, has been a trend since the 1980s, intensifying in the 1990s and contributing to the creation of a new urban fabric, characterized by socio-spatial segregation. Gated communities grew significantly from the 1990s onwards, driven by changes in municipal legislation that allowed this type of land use. From the 2010s onwards, this form of housing expanded to other social classes, with condominiums aimed at the middle class, especially in areas closer to the city

Coelho, lacking direct connections to Campinas, raises questions about the metropolitan profile based on integration. Proximity and accessibility via fast roads influence residents' choices of residence and workplace. Highways connecting cities, along with avenues and streets within urban areas, not only facilitate urban expansion but also contribute to the region's rhizomatic nature (Marandola Jr. et al., 2006).

7. Conclusion

The mutations along main roads offer opportunities for urban expansion, filling urban voids and potentially shaping a vast area in the future. Although the term 'urban mutations' is not contemporary with dormitory cities, peripheral cities surrounding Campinas often fit the description and were built as such. Changes in the suburban center can have a significant impact on surrounding cities, especially when the center becomes vacant, leading neighboring cities to establish their own centers and assert their independence from the metropolis.

Small cities within a metropolitan area have unique characteristics, particularly when the process of metropolization is ongoing. This process produces distinct attributes for cities, both spatially and economically. However, the creation of a metropolitan region does not guarantee uniformity among its municipalities. Despite being in a metropolitan context, small cities in the Campinas Metropolitan Region may display non-metropolitan characteristics or be far from economically dynamic centers. More studies are needed to explore this relationship, especially concerning the impact of urban change on already urbanized cities.

8. References

- [1] Turczyn, D. T., et al. Mutações urbanas em Campinas: suas tipologias e padrões de implantação. In: PNUM 2018: A Produção do Território: Formas, Processos, Desígnios; 2018.
- [2] Caldeira, T. P. D. R. Cidade de muros: crime, segregação e cidadania em São Paulo. São Paulo: Ed. 34, Edusp; 2000.
- [4] Ojima, R., Hogan, D. J. Crescimento Urbano e Peri-Urbanização: Redistribuição Espacial da População em Novas Fronteiras da Mudança Ambiental. In: IV Encontro Nacional da Anppas; June 2008. Available at: <http://anppas.org.br/encontro4/cd/ARQUIVOS/GT8-358-131-20080510024039.pdf>
- [5] Solà-morales, I. Territorios. Barcelona: Gustavo Gili; 2002.
- [6] Silva, P. F. F. D. A expansão urbana de Campinas através de condomínios e loteamentos fechados (1974 - 2005). Dissertation (Mestrado em Teoria e História da Arquitetura e do Urbanismo) - Escola de Engenharia de São Carlos, Universidade de São Paulo, São Carlos; 2008. Retrieved from <http://doi.org/10.11606/D.18.2008.tde-19082008-13592>. Accessed on: 2024-03-30.
- [7] Oliveira, V., Zaitter, B. (Eds.). O Estudo da Forma Urbana no Brasil. Urbe, Revista Brasileira de Gestão Urbana, 12; 2020. Retrieved from <https://doi.org/10.1590/2175-3369.012.e20190260>
- [8] Lapa, J. R. A. Cidade: os cantos e os antros. São Paulo: EDUSP; 2008.
- [9] Almeida, J. G. R. Desigualdade, fragmentação e segregação na metrópole contemporânea: a urbanização no entorno da rodovia Dom Pedro I em Campinas. Campinas; 2023.
- [10] Coelho, L. L. Dispersão, fragmentação e paisagem: relações entre dinâmicas naturais e urbanas no vetor oeste da Região Metropolitana de São Paulo. Dissertation de Doutorado em Arquitetura e Urbanismo, Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo; 2015.
- [11] Suarez, P. S. M. O eixo São Paulo-Campinas: concentração de capitais e segregação urbana. Dissertation (Mestrado) - Faculdade de Arquitetura e Urbanismo, Universidade de São Paulo, São Paulo; 2014.
- [12] Marandola Jr., E. Habitar em Risco: mobilidade e vulnerabilidade na experiência metropolitana. Campinas: Tese de Doutorado - Instituto de Geociências, UNICAMP; 2008.
- [13] Gonçalves Junior, F. A., Corrêa, T. C. "Entre Rodovias: reflexões sobre a estruturação da paisagem urbana na região metropolitana de Campinas."
- [14] Moreira Jr, O. Articulação e integração metropolitana, o papel das cidades pequenas na região de Campinas (SP). Confins, 29. DOI: <https://doi.org/10.4000/confins.11434>. Accessed on: April 1, 2024.