SECURITY DEVICES AND SEGREGATION MEASURES THAT PROMOTE HOMOGENEITIES AND HETEROGENEITIES IN THE WESTERN SUB-REGION OF THE SPMA

*Luiz Gonzaga Philippi Filho**
*Adriana Marques Rossetto**

*Universidade Federal de Santa Catarina, Departamento de Arquitetura e Urbanismo, Florianópolis, SC, Brazil

Abstract

From the perspective of security devices and segregation measures, in a gradient of low-, middle-, and high-income populations together with buildings of low, standard, and high construction levels, this study examines the socio-spatial segregation in peripheral territories in the western sub-region of the São Paulo Metropolitan Area (SPMA). Employing the Street View tool and engaging with visual data via hyperlinks and QR codes, the objective is to illustrate, on a more individual level – at the scale of the human body and from a pedestrian's perspective –, how segregation measures materialized in urban space are related to the homogeneities and heterogeneities that coexist in peripheral territories, the very configuration of the urban environment, together with its social interactions, and formative processes. By drawing on statistical data regarding victimization, based on references from the fields of anthropology and sociology, and analyzing contrasting situations along access routes for housing units through to large real estate developments, the study highlights how individualistic measures, to varying degrees, influence the design of the city and the everyday life of the population.

Keywords

Inequality and Social and Spatial Segregation; Social and Spatial Differentiation; Metropolitan Space; Street View; Western Sub-Region of SPMA; Individualism; Everyday Life.

DISPOSITIVOS DE SEGURANÇA E MEDIDAS SEGREGADORAS QUE PROPICIAM HOMOGENEIDADES E HETEROGENEIDADES NA SUB-REGIÃO OESTE DA RMSP

*Luiz Gonzaga Philippi Filho**
*Adriana Marques Rossetto**

*Universidade Federal de Santa Catarina, Departamento de Arquitetura e Urbanismo, Florianópolis, SC, Brasil

Resumo

Pela perspectiva dos dispositivos de segurança e medidas segregadoras, num gradiente das populações de baixa, média e alta renda e em construções de baixo, normal e alto padrão construtivo, apresentam-se, com o uso da ferramenta Street View e a interação com os dados visuais por meio de hyperlinks e QR Codes, exemplos de segregação socioespacial em territórios periféricos na sub-região oeste da Região Metropolitana de São Paulo (RMSP). Pretende-se expor, em uma instância mais individual – na escala do corpo humano e no nível do pedestre –, como medidas segregadoras materializadas no espaço urbano se relacionam com homogeneidades e heterogeneidades que coabitam territórios periféricos, a própria conformação urbana, suas interações sociais e processos de formação. Utilizando dados estatísticos sobre vitimização embasados por referências da Antropologia e da Sociologia, analisando situações contrastantes nas vias de acesso de unidades habitacionais até enormes empreendimentos imobiliários, evidencia-se como medidas individualistas influem, de diferentes maneiras, no desenho da cidade e no dia a dia da população.

Palavras-chave

Desigualdade e Segregação Socioespacial; Diferenciação Socioespacial; Espaço Metropolitano; Street View; Sub-Região Oeste da RMSP; Individualismo; Cotidiano.

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Introduction

This article examines socio-spatial segregation through examples of peripheral territories in the western sub-region of the São Paulo Metropolitan Area (SPMA). It employs a qualitative approach, integrating examples and analyses of socio-spatial homogeneities and heterogeneities shaped by the presence of security devices and segregation measures.

With the potential to complement other methodologies and areas of urban studies, this article offers a possible method for observing, recording, and studying the contradictions embedded in the "patchworks" of everyday life (Certeau, 1998, p. 46). Its analyses and reflections contribute to a broader understanding of social relations within this urban landscape – both ostensively and normalized – capturing dynamics that may elude strictly objective or statistical methods.

To this end, the study employs multimedia tools that enable an examination of the everyday landscape and its transformations over time, with a particular focus on Google Street View images (which have been available online for over a decade), in conjunction with other quantitative data. This approach underscores the normalization of these realities, documenting situations that, while seemingly adverse or unacceptable to a critical observer, may appear commonplace, routine, or even unworthy of closer scrutiny from a more conventional perspective.

1. Theoretical framework

The phenomenon of peripheralization, closely tied to the capitalist dynamics of accumulation, results in dispersed settlements around urban centers, marked by a growing distance from urban infrastructure, and the need for increased commuting. It also fosters a structural form of gentrification that extends the urban fabric, leading to progressively disjointed, fragmented, and polarized spatial configurations (Kowarick, 2017; Barcella; Melazzo, 2020; Almeida, Amano; Tupy, 2022). While this process predominantly impacts low-income populations, capitalist accumulation through urban expansion has also attracted high-income groups to these areas. However, social coexistence in peripheral areas has not taken place in an integrated manner; instead, it is characterized by spatial fragmentation and isolation between different social classes, even in areas where their territories overlap (Silva; Sposito, 2024).

In this context, real estate practices reinforce separation, restrict social interaction, and obscure inequalities, while fragmentation and isolation are further exacerbated by the obsession for security embedded in fortified enclaves – both physically and symbolically enclosed spaces (Caldeira, 1997; Fornasier, Ferreira; Ferreira, 2019; Richmond; Kopper, 2022). This excessive introduction of security measures, coupled with the concurrent decline of public spaces, is a phenomenon also observed in other cities and countries globally (Caldeira, 2000; Graham; Marvin, 2001; Davis, 2006). The pursuit of isolation, whether for social distinction or security, has also been incorporated into housing policies for low-income populations, replicating patterns of isolated, fragmented, and peripheral social housing across various cities in the country. However, the Brazilian population's engagement with peripheral expansion and the concept of "insurgent citizenship" (Holston, 2013) do not fully capture the most recent socio-spatial transformations and differentiations unfolding across these territories (Richmond, 2020).

Data from the National Household Sample Survey (PNAD) on victimization demonstrate that, in 2021, 68% of Brazilian households had some form of security device or employee, with the Southern region of the country reporting the highest percentage of 76.2%. However, in 2009, all regions of the country recorded levels of over 50%, and in 2021 over 60% (IBGE, 2010, 2022a). Nonetheless, a more specific and comparative basis over the past decade has revealed that the "feeling of security" among the Brazilian population was not significantly impacted by the individual security measures installed in their homes: "89.7% of people felt secure in households with at least one security device, compared to 89.1% of people in households without such protections"[1] (IBGE, 2022b, p. 2). These more recent findings align

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1. This and all other non-English citations hereafter have been translated by the authors.

with Caldeira's (2000) empirical study, which demonstrated that the public's sense of security is more strongly influenced by personal – often indirect – experiences with crime. Meanwhile, security measures installed in homes, which alter both the internal arrangement of residences and the urban landscape in terms of freedom and accessibility, have minimal impact on a perceived improvement in security.

Both national and international literature on the topic suggest that, in addition to being insufficiently explored, the methods for studying it require new approaches to overcome methodological challenges related to data availability and the ability to compare and track data within a spatiotemporal framework (Melazzo et al., 2023). It is thus argued that "broader interpretations are needed, encompassing general, particular, and singular processes [...] as an essential condition for advancing the understanding of real estate dynamics" (Melazzo et al., 2023, p. 3).

2. Methodology and a spatiotemporal framework

Technological advances in geographic information system (GIS) platforms and geoprocessing software have enabled geotechnology to integrate other disciplines into urban studies (Perez Filho; Lämmle; Moreira, 2020). The enhancement of Street View tools, which capture the urban landscape through panoramic or omnidirectional photographs of streets, has garnered significant attention in studies into urban space (Wang; Wenjie; Yao, 2023, p. 2), although less so than the focus on aerial imagery tools. Since its introduction, the use of Street View in statistical studies has been put into question, with concerns that incorporating street-level images into large data sets may lead to an algorithmic classification of places based on their visual qualities, potentially abstracting both qualitative and quantitative data and reducing its empirical advantage over aerial images (Shapiro, 2017, p. 1-3). A key distinction lies in the positioning and viewpoint of the visual record: while aerial images offer a "view from nowhere", detached from human activities, street-level images are "explicitly grounded in a somewhere" (Shapiro, 2017, p. 2, emphasis in original).

A further issue raised concerns regarding the autonomy and consent of the individuals and communities captured in Street View images, since there is no local involvement or consultation in the image collection process. This necessitates viewing these records not as an accurate representation of reality but as a social construction (Power et al., 2013). Since this technology ostensibly "eliminates the conscious existence of the traditional photographer in the image production process" (Pedrosa, 2018, p. 24), the focus shifts from analyzing the intentions of an individual photographer to examining the conditions under which such technology is deployed.

Thus, for this technology to be effectively utilized in academic studies, it is essential to account for its limitations and potentialities, such as in the observation of synchronicities and diachronic events (Frúgoli Junior; Chizzolini, 2017, p. 29), with the goal of improving the visual systematization of the recurring phenomena. In this regard, a pressing limitation arises from the timing of image capture: approximately 95% of studies based on Street View images rely on daytime records (Liu et al., 2024). This restricts the images to those with daytime characteristics (sunlit, shadowed, vibrant), while also affecting what is captured (pedestrian circulation, the open or closed status of businesses, urban lighting, etc.).[2]

As the literature review indicates, studies that incorporate Street View as a complementary tool alongside other data collection methods – addressing deficiencies while leveraging its visual potential – can effectively utilize it to "systematize, in a visual manner, a brief historical temporality of the place" (Pereira; Carneiro; Pereira, 2019, p. 94-5). Even when employed to generate quantitative data and establish indices, these studies reveal the tool's potential for assessing the urban landscape and conditions in ways that statistical abstractions may fail to capture (Li, 2020). However, its application for comparative analysis across different dates remains relatively underexplored in the literature, predominantly confined to quantitative analyses (Biljecki; Ito, 2021, p. 8).

Thus, this exploratory research focuses on the study of segregation measures, illustrating in-depth concepts from the literature through concrete examples. Adopting a qualitative methodology within a phenomenological approach and employing the technique of indirect observation, the study adopts a descriptive stance and an inductive analysis of the data. Various media sources have been used to illustrate, exemplify, and communicate cases of socio-spatial segregation in an accessible manner.

The method consisted of the following steps: identifying the phenomenon (facilitated by the tools used), surveying the situation (spatial verification through maps, social verification through cadastral or census data, and contextual verification through official statements, news reports, testimonies, or advertisements), observing the case (analyzing Street View images over time), and assessing the case (cross-referencing all these data and analyses).

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2. Both ethical questions were artistically expressed in the work *Nunca é noite no mapa* [It's never nighttime on the map] by Ernesto de Carvalho (2016). For further in-depth analysis, see Favretto and Vassali (2020). *NUNCA é noite no mapa*. Directed by Ernesto de Carvalho. Recife: *Zumbayllu Mesmo Assim A Gente Faz* [Recife: Zumbayllu, Even So, We Still Do It], 2016. 1 Video (6 min). Available at: https://vimeo.com/175423925. Accessed on: 27 Feb. 2025; FAVRETTO, A.; VASSALI, M. *Narrativa em tecnologias móveis*: *reflexões sobre o curta "Nunca é noite no mapa"*. [Narrative in mobile technologies: reflections on the short film *Nunca é noite no mapa*. V!RUS, São Carlos, No. 21, Semester 2, Dec. 2020.

Since Street View images can be manipulated both positionally and chronologically, they offer an opportunity for reader collaboration by incorporating new perspectives, reinforcing their presence in the urban everyday life. Therefore, each image used was accompanied by a corresponding link, along with QR codes as an invitation for interaction. This enables individuals to access specific locations and timestamps, and propose new framings that enhance the reflection. Even when reading a printed version of this work, users may simply scan the code with their phone camera and click the Google Maps icon to be directed to the page, where they are able to access the image and reconsider its perspective.

The western portion of the São Paulo Metropolitan Area (SPMA) was defined as the spatial focus for a combination of several key factors: it contains emblematic examples of self-segregation (Souza, 2008, p. 70-1) and socio-spatial inequality, which are central to the qualitative analyses of this work; it offers various available data for the application of the chosen method; and it aligns with some of the theoretical frameworks employed in the study.[3]

This region, historically recognized for its economic development and emerging urban growth, is marked by "intense activity in the real estate market, with the sale of large plots designated for businesses, industries, logistics warehouses, and residential condominiums" (Garbosa; Moreira, 2024, p. 126). Additionally, the region's highways and distribution of infrastructure facilitate "control over the flows of lower-income people within the city, who tend to concentrate in the poorer

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3. For a broader historical context of the expansion and urban and real estate development in the western portion of the SPMA, please see the monographs by Cavalcante (1978), Guerra (2013), Coelho (2015), Roggero (2015), and Leopoldo (2017), as well as articles by Pescatori (2017) and, more recently, Garbosa and Moreira (2024). CAVALCANTE, T. C. *Barueri e sua participação no conjunto da faixa periférica da metrópole paulistana*. [Barueri and its role in the peripheral belt of the São Paulo metropolis]. 1978. 128 pages. Master's thesis in Human Geography – Faculty of Philosophy, Letters, and Human Sciences (FFL-CH), Universidade de São Paulo, São Paulo, 1978; GUERRA, M. F. *Vende-se qualidade de vida: Alphaville Barueri: implantação e consolidação de uma cidade privada*. [For Sale: Quality of Life: Alphaville Barueri: The Implementation and Consolidation of a Private City]. 2013. 262 pages. Master's thesis in Urban and Regional Planning – Faculty of Architecture and Urbanism, Universidade de São Paulo, São Paulo, 2013; COELHO, L. L. *Dispersão, fragmentação e paisagem: relações entre dinâmicas naturais e urbanas no vetor oeste da Região Metropolitana de São Paulo*. [Dispersion, Fragmentation, and Landscape: Relationships between Natural and Urban Dynamics in the Western Vector of the São Paulo Metropolitan Area]. 2015. 373 pages. Doctoral thesis in Landscape and Environment – Faculty of Architecture and Urbanism, Universidade de São Paulo, São Paulo, 2015; ROGGERO, M. A. *Qualidade de vida urbana nas bordas da metrópole: centralidades e periferias* [Urban Quality of Life at the Edges of the Metropolis: Centralities and Peripheries]. 2015. 219 pages. Doctoral thesis in Physical Geography – Faculty of Philosophy, Letters, and Human Sciences, University of São Paulo, São Paulo, 2015; LEOPOLDO, E. *Financeirização imobiliária e metropolização regional: o Alphaville na implosão-explosão da metrópole*. [Real Estate Financialization and Regional Metropolitanization: Alphaville in the Implosion-Explosion of the Metropolis]. 2017. 500 pages. Doctoral thesis in Human Geography – Faculty of Philosophy, Letters, and Human Sciences, Universidade de São Paulo, São Paulo, 2017; PESCATORI, C. A*lphaville e o planejamento da descentralização de São Paulo* [Alphaville and the Planning of São Paulo's Decentralization]. In: ANPUR NATIONAL MEETING, 17, 2017, São Paulo. Proceedings [...], v. 17, n. 1. São Paulo: Anpur, 2017.

subcenters of the neighborhoods," thereby establishing a "pattern of fragmented urbanization that deepens spatial segregation, and isolates higher-income groups" (Garbosa; Moreira, 2024, p. 140-1).

The temporal scope of this study begins in 2010, when Google launched its Street View service in Brazil, considering the urban context as well as morphological, legal, and management changes. The selection of this period also accounts for the timely availability of relevant data, particularly visual resources (photos, maps, censuses, and official indices). Furthermore, while Street View is employed as a complementary tool to other data, its limitations are acknowledged, including the timing of image capture (limited to daylight hours) and the lack of access to certain areas (such as gated communities or difficult-to-reach terrains). Consequently, the analysis of these images is viewed as part of a comprehensive urban study, supporting and corroborating the other data consulted.

To analyze the housing characteristics for both high- and low-income peripheral populations, a correlation was established between the construction standards of the dwellings and the average income of the population. The first factor was assessed through the empirical observation of typologies, construction methods, and materials, and validated by the parameters of NBR[4] 12721:2006 and data from the National System of Research on Construction Costs and Indices (Sinapi), the Basic Unit Cost (CUB), or the property's market value. Meanwhile, the average income of the population was derived from IBGE[5] data. Although this relationship can be verified in each example studied through geoprocessing data from the 2010 IBGE Census, some distortions required assessment by cross-referencing these with other data sources, such as the São Paulo Social Vulnerability Index (IPVS), due to the spatialization of estimates or outdated data.

Lastly, it is important to note that the examples and analyses presented in this article were selected from a broader pool of cases studied within the region, with the aim of more effectively representing the socio-spatial dynamics addressed. The text specifies when the cases are unique or recurrent across the study area.

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4. Brazilian Standard – a set of technical standards established by the Brazilian Association of Technical Standards [Associação Brasileira de Normas Técnicas (ABNT)].

5. The Brazilian Institute for Geography and Statistics [Instituto Brasileiro de Geografia e Estatistica (IBGE)].

3. Examples of security devices and segregation measures in the western sub-region of the SPMA

Supported by IBGE data (2010), the greatest difference between the sense of security felt by higher-income individuals in their homes[6] and in their neighborhood or city is reflected in examples of homes that have been forcibly isolated. In contrast, the smallest difference for lower-income individuals can be represented by homes that are closer to public roads and neighboring properties within the neighborhood.[7] In summary, higher-income people tend to experience greater fear in their own neighborhood or city, frequently shutting themselves off in their homes, fortified with advanced security devices enabled by their financial means. On the other hand, lower-income people tend to fear their neighborhood and city less in relation to their homes, making them more open to the public space around their residences, which, even with simpler security devices, are physically closer to the street.

This will be demonstrated with the following examples, around the cluster of gated communities in the western sector of the SPMA (Figure 1), where the constant presence of security devices, in their respective forms and dimensions, accompanies the conditions of urban infrastructure. It is possible to observe, in the increasing gradient of the construction standards of the buildings, how the feeling of insecurity materializes in the production of urban space.

The phenomenon of metal bars and other ostensive security devices – more solid, such as high walls topped with glass shards, barbed wire, or electric fences, or more fluid, with cameras, guardhouses, and security guards – may be observed in almost all the dwellings within the focus area of the study. The exceptions are precisely within the gated communities, as these homes are already enclosed by walls or other boundaries equipped with these devices.[8] Analyzing the occurrence of these "individual fortresses" of the upper class in different urban settings, when examining lower- and middle-class neighborhoods, Caldeira (2000, p. 317) noted

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6. Statements by the interviewees "allowed us to affirm that, as the population moved farther from their home, the sense of security decreased" and that income influences this perception: the higher the income, the greater the sense of security at home and the lower the sense of security in the neighborhood and city, proportionally. (IBGE, 2010).

7. The difference of nearly 20% between the sense of security of the lower and higher income groups regarding the city, and only 5% regarding the home, demonstrates that higher-income people do not feel significantly safer in their homes, although they feel proportionally much more insecure in their neighborhood or in the city.

8. When high-income homes are not part of these private urbanization models, they often feature houses or buildings of high construction standards that adopt similar security methods for the public street, but in a more individual manner.

that, although they still express greater urbanity, relatively similar behaviors occur within these social strata. Even in self-built areas, residents of these income brackets seek to fortify their homes, streets, and neighborhoods, albeit in a fragmented manner (Richmond; Kopper, 2022).
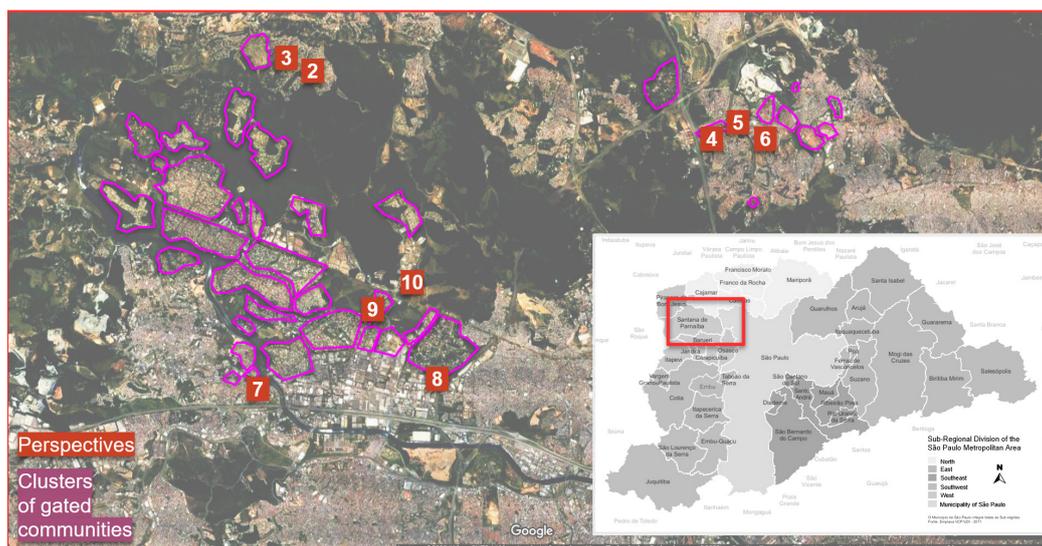

Figure 1. Location of perspectives and clusters of gated communities in the western sub-region of the SPMA

Source: Adapted from Google © 2023 Airbus, CNES / Airbus, Maxar Technologies.

In examples of low-standard constructions in the surroundings of these clusters of gated communities, in more incipient settlements (such as the Cidade São Pedro neighborhood), elements like roll-up doors, iron gates and barred windows accompany the construction of buildings, very often temporarily preceding the incorporation of permanent enclosures, such as wooden doors or framed glass windows. Figure 2 illustrates these phases of consolidation from right to left.

As settlements become more established, elements such as protective bars over doors and windows also become common, with, over time, the simultaneous emergence of local metalwork shops offering these services. This phenomenon occurs in all communities with similar construction standards in the studied region, as may be observed by comparing Street View images over the past decade (Figure 3).
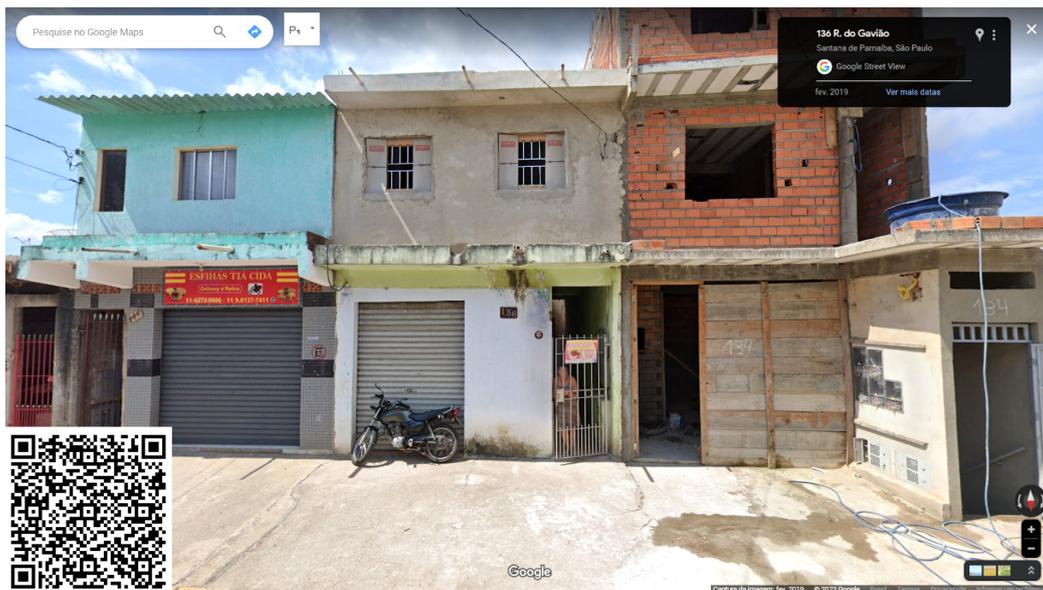
Figure 2. The situation of Rua do Gavião, Cidade São Pedro, Santana de Parnaíba, in February 2019
Source: Google Street View. Available at: https://maps.app.goo.gl/Di3P9JJ7UyKW2Uqs8?g_st=ic.
Accessed on: February 27, 2025.

The provisional nature of the infrastructure and urbanization elements in these settlements illustrates how incorporation of the neighborhood takes place while its population is already living there. Features such as water tanks, utility meters, posts and cables, satellite dishes and fishbone antennas, as well as house numbers, and street signs are gradually replaced or executed using permanent materials and finishes, alongside the paving and asphalting of roads. Public lighting and tree planting however, are inconsistent, and appear only sporadically. In addition to signs for businesses and services, numerous political campaign advertisements – featuring faces and numbers, primarily of city council candidates – are displayed on building facades, potentially tied to processes of land regularization and urban development.

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Figure 3. The situation of Avenida Fortunato Camargo, Cidade São Pedro, Santana de Parnaíba, in March 2010 and June 2019

Source: Google Street View. Available at: https://maps.app.goo.gl/cQECNC8pY89d4eth6?g_st=ic; https://maps.app.goo.gl/XF79WiEfAwQ5phHm6?g_st=ic. Accessed on: February 27, 2025.

Unlike these low-standard constructions, lower-income housing complexes and estates are initially incorporated and then later occupied. However, after years of use and habitation, these buildings gradually diverge from their original designs and inaugural features, a possible reflection either of the mismatch between these structures and the residents' needs or shifts in values and attitudes over time. Images from the past decade reveal the construction or extension of walls and fencing, as well as the installation of security devices.

In the neighborhoods of Colinas da Anhanguera[9] and Jardim Ipanema (Figure 4), examples of these incorporations illustrate how the urban street life – with local businesses, services, pedestrians, and children at play – coexists with small enclaves (when compared to gated communities). However, despite the presence of overt security measures, such as high walls, metal bars, barbed wire, or surveillance cameras, a certain degree of permeability nonetheless remains evident. This may be observed with open gates, which are closed at specific hours, commercial establishments that face onto the streets, and in the very scale and proximity of the buildings. In the vertical model, socio-spatial segregation is also less pronounced compared to gated communities, reinforcing the notion that "the promotion of this market segment is more often associated with homeownership than with the guarantee of social exclusivity" (Cerqueira, 2015, p. 209).
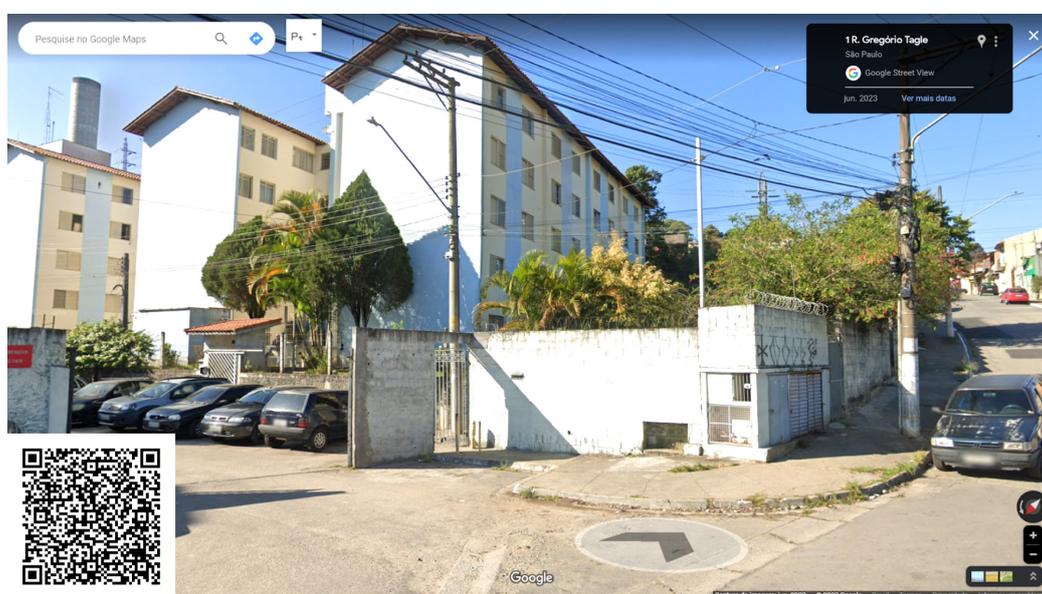

Figure 4. The situation on Rus Gregório Tagle, Jardim Ipanema, São Paulo, in June 2023
Source: Google Street View. Available at: https://maps.app.goo.gl/xAkPjTKMVEcGFuLn9?g_st=ic. Accessed on: February 27, 2025.

One possible interpretation of the proliferation of walls in peripheral areas involves comprehending access to citizenship, which concerns dignity, comfort, and participation in consumer culture, as well as a desire to create distance from informality and insecurity (Richmond; Kopper, 2022, p. 80). Another key factor

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9. GOOGLE. Street View image of the situation on Alto da Boa Vista Street, Colinas da Anhanguera, Santana de Parnaíba, in March 2021. Available at: https://maps.app.goo.gl/YgdBcUnqJtCVsqkw5. Accessed on: February 27, 2025.

relates to Brazilian urban development models and real estate dynamics, including housing policies and public-private initiatives that foster tenure regularization and the incremental installation of infrastructure and public services (Richmond; Kopper, 2022, p. 78).

When examining older, more established neighborhoods, such as the adjacent Jardim Rincão (Figure 5) and Jardim Alvina[10] in São Paulo, a focus on more consolidated buildings reveals, through images over the past decade, the frequent addition of security devices to permanent enclosures, such as doors and windows. Although infrastructural inequalities between neighborhood streets and the avenues leading to gated communities are evident, constant urban interactions can only be observed in neighborhoods where, similar to the previous examples, the scale and typology of buildings encourage engagement with public space. Comparing these two neighborhoods throughout the entire study period, Jardim Rincão exhibited greater street activity and more people interacting at the building interfaces, such as doors and windows. Beyond the daytime images collected over ten years, this analysis is further reinforced by the presence of urbanity indicators.

Figure 5. The situation on Rua Capitão Oliveira Carvalho, Jardim Rincão, São Paulo, in March 2022
Source: Google Street View. Available at: https://maps.app.goo.gl/S8WRvJbZNb6SgpZK9?g_st=ic. Accessed on: February 27, 2025.

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10. GOOGLE. Street View image of the situation on Rua Rio da Fronteira, Jardim Alvina, São Paulo, in March 2022. Available at: https://maps.app.goo.gl/rdcLzTcRzaWTtBJPA?g_st=ic. Accessed on: February 27, 2025.

In Jardim Rincão, there is greater degree of mixed land use, with a public school, the EMEF[11] Padre Leonel Franca, located on a secondary street, surrounded by residences and neighborhood businesses, resulting in high pedestrian circulation. In contrast, Jardim Alvina is predominantly residential, in which the buildings are surrounded by a wide arterial road, Avenida Raimundo Pereira de Magalhães. This road separates the residential and commercial areas and isolates the neighborhood from the public school EMEF Professora Eliane Benute Lessa Ayres Gonçalves, located on the opposite side of the avenue. From a morphological perspective, the first neighborhood, which is less affluent, has greater density, with a few alleys cutting through the blocks, gates that are closed after a certain hour, and a higher occurrence of street corners. The second, with a higher construction standard and better socioeconomic conditions,[12] features wider streets, lots with larger frontages, and several dead ends. Even though in both cases, it is possible to observe people behind the railings of their homes in Street View images, and corroborating this information with urban elements that indicate, or not, pedestrian circulation throughout the daytime, it is only possible to observe in the records of Jardim Rincão that people frequently appear on the sidewalks interacting with others.

In the proximity of this low- and middle-income population, which was established over a decade ago, more recently constructed gated communities, intended for higher-income residents, are enclosed by walls, accompanied by areas of green space and avenues that connect them to other neighborhoods. In addition, the walls are lined with lawns, thereby complying with the permeable area regulations of the master plans. Although the construction standards of these gated communities are not as high as those of other communities in the sub-region, and there is no significant difference between the construction standards of these communities and those of the low- and middle-income neighborhoods, they have nevertheless adopted this separation strategy. Public roads that only connect the neighborhoods to the gated communities (Figure 6), as seen in the image of Avenida Amador Aguiar (parallel to Rua Capitão Oliveira Carvalho, in Jardim Rincão, Figure 5), form corridors of double walls. These are equipped with security devices, sidewalks, bike lanes, and well-paved roads, accompanied by landscaping and fences for the embankment that separates the road from the adjacent neighborhood. It is also possible to observe how, over the past

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11. *Escola Municipal de Ensino Fundamental* – Municipal Elementary School.

12. According to IPVS data provided by the GeoSampa platform of the São Paulo City Hall (São Paulo, 2023), the neighborhood of Jardim Rincão predominantly presents very high and high vulnerability, while the neighborhood of Jardim Alvina mainly displays low and very low vulnerability.

decade, this high-quality infrastructure for high-income populations has been implemented simultaneously with the construction of these new communities, while the surrounding neighborhoods, with poor infrastructure and lower-income populations, had already been established. In the image in question, one of the communities is in the final stages of construction, and another has yet to be implemented.
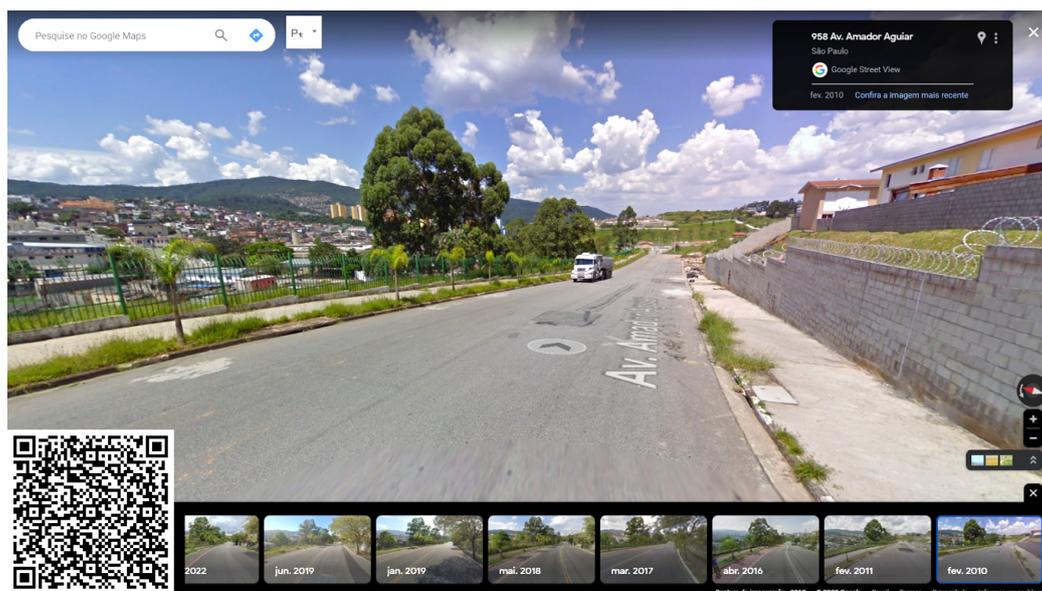

Figure 6. The situation on Avenida Amador Aguiar, Jaraguá, São Paulo, in February 2010
Source: Google Street View. Available at: https://maps.app.goo.gl/gdcE9aHFTUaKi1Qw5?g_st=ic. Accessed on: February 27, 2025.

This implementation model "promotes social homogeneity within its walls", that "creates homogeneous territories, strongly segregated from the rest of the municipality" (Cerqueira, 2015, p. 209). In addition, alongside the security devices, green spaces within the urban fabric are strategically used to reinforce segregation for gated communities. This pattern is prevalent throughout the western subregion of the SPMA, often incorporating natural barriers such as hills and rivers. In some cases, only vegetation and a river separate the gated communities, between one wall and another,[13] while in other instances, mixed-use neighborhoods and public roads running along the river lie between a community and its neighbors.[14]

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13. GOOGLE. Street View image of the situation on the access road to the gated community in Tarumã, Santana de Parnaíba, in May 2018. Available at: https://maps.app.goo.gl/c59b19tvMhN4v9AdA. Accessed on: February 27, 2025.

14. GOOGLE. Street View image of the situation on Rua Irã, Jardim São Luiz, Barueri, in March 2023. Available at: https://maps.app.goo.gl/p2pNMtKunBWkgD8M7. Accessed on: February 27, 2025.

On the other side of the Tietê River, neighborhoods in Barueri, such as Jardim dos Camargos (Figure 7) and Vila Boa Vista,[15] feature buildings with low to standard construction levels, and are home to low- and middle-income populations. In contrast to the previous examples, where the population is predominantly of low income, the walls here differ in height and opacity, and the facades no longer interface with the streets. While urban infrastructure such as paving and the road size has been improved, lighting and tree cover remain scarce, with greenery often confined to the interior of the lots. There has also been a rise of overt security devices – such as barbed wire, electric fences, and surveillance cameras – used on an individual basis, whereas previously these were primarily found in housing complexes and gated communities. These devices are becoming increasingly more common, extending to buildings with higher construction standards intended for higher-income populations. Consequently, elements such as barred windows and doors are less frequently seen, typically confined to the ground floors, since windows in houses and apartment buildings are positioned farther from the streets and are shielded by more equipped walls.
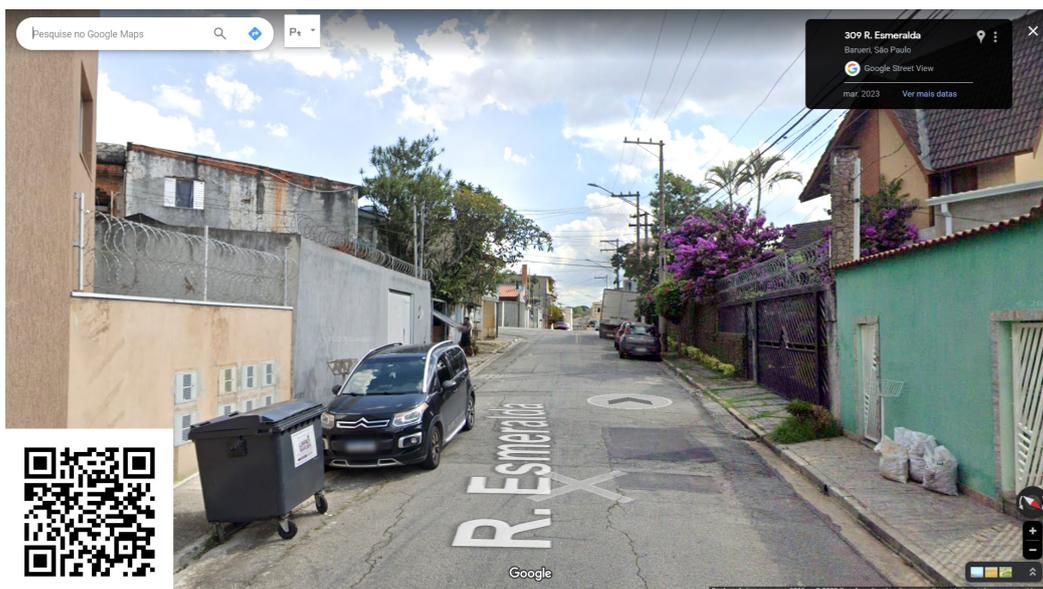

Figure 7. The situation on Rua Esmeralda, Jardim dos Camargos, Barueri, March 2023
Source: Google Street View. Available at: https://maps.app.goo.gl/Yh8vEEMnQ8jNedLk6?g_st=ic. Accessed on: February 27, 2025.

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15. GOOGLE. Street View image of the situation on Rua Carlos de Campos, Vila Boa Vista, Barueri, in March 2023. Available at: https://maps.app.goo.gl/tbs8aMMqgM3qxgtf8?g_st=ic. Accessed on: February 27, 2025.

The quality of the security devices themselves changes as the construction standard and the income of the population increase, which becomes more evident in the design of the metal bars and barbed wire. The latter is used in an orthogonal manner, with concertina wire being reserved to protect less visible areas, such as trash bins and garage exits of the developments.

Similar to horizontally-gated communities and housing complexes, buildings with higher construction standards, consisting of multiple blocks and internal circulation roads, are closed off like vertically-gated communities that occupy entire blocks or sections of land. In these, the same methods of separation may be observed in relation to neighboring individual units, as seen in the case of the Jardim Tupanci[16] neighborhood, or even in relation to other apartment building condominiums, which employ individual security systems that often become redundant, as in the case of Tamboré.[17]

Finally, gated communities exhibit a wide array of segregationist measures. Although the walls themselves are blank – offering no permeability through windows, doors, or active facades that foster "eyes onto the street" (Jacobs, 2000, p. 35), overseeing both public and private spaces – they contain visual instruments for surveilling public space and protecting the private development. For example, they are equipped with security cameras and guardhouses (Figure 8), with the former placed at intervals along the entire wall and the latter strategically positioned at the corners and entrances of the communities. Large fortified complexes also have their own water, transportation, and energy services, which symbolically distance them even further from engagement with the metropolitan fabric, despite physically exploiting the natural and human resources of the latter, thus exacerbating segregation and its distinction (Graham; Marvin, 2001).

This distinction in wall quality between gated communities and other buildings becomes apparent, even in neighborhoods with populations of uniformly similar income.[18] In the vertical model, building complexes still maintain some interaction between the walled units and public streets, such as ground-floor commerce, pedestrian pathways leading to the entrance, or, even if distant, windows facing

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16. GOOGLE. Street View image of the situation on Rua Werner Goldberg, Jardim Tupanci, Barueri, in March 2021. Available at: https://maps.app.goo.gl/8pkFpFpUUeXkDzT96?g_st=ic. Accessed on February 27, 2025.

17. GOOGLE. Street View image of the situation on Alameda Canto dos Pássaros, Tamboré, Santana de Parnaíba, in May 2019. Available at: https://maps.app.goo.gl/MTMTdbjD8MdGbNNk8?g_st=ic. Accessed on: February 27 2025.

18. GOOGLE. Street View image of the situation on Avenida Ômega, Alphaville, Barueri, in March 2021. Available at: https://maps.app.goo.gl/jvfSsN63H1WrXS2a9?g_st=ic. Accessed on: February 27, 2025.

onto the street.[19] In contrast, the horizontal model, which covers a much larger area with units more spread out and concealed by the height of the walls in relation to the buildings, features extensive sections of opaque uninterrupted barriers.[20] In both cases, there are systems for identification, segregated social and service access points, gates and barriers, as well as security cameras and guards.[21]

Figure 8. The situation on Avenida Ceci, Tamboré, Barueri, in March 2022
Source: Google Street View. Available at: https://maps.app.goo.gl/C5Er9odkWBs6Syov8?g_st=ic. Accessed on: February 27 2025.

In the urban context, even flower beds with grass and trees (typically designed to meet the permeable area requirements of the master plan) become part of the security system in these communities, complemented by fences and

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19. GOOGLE. Street View image of the situation on Alameda Canto dos Pássaros, Tamboré, Santana de Parnaíba, in May 2019. Available at: https://maps.app.goo.gl/DDMmGZdSrDavn6tRA?g_st=ic. Accessed on: February 27 2025.

20. GOOGLE. Street View image of the situation on Avenida Mackenzie, Tamboré, Barueri, in May 2019. Available at: https://maps.app.goo.gl/qYAyV4PsqQKCLikt6?g_st=ic. Accessed on: February 27, 2025.

21. GOOGLE. Street View image of the situation on Alameda Gregório Bogossian Sobrinho, Tamboré, Barueri, in March 2021. Available at: https://maps.app.goo.gl/fRgzSb4dJTY3KFxz6?g_st=ic. Accessed on: February 27, 2025.

metal bars,[22] elevated by embankments[23] or even interspersed with sidewalks.[24] In all cases, security devices such as barbed wire, electric fences, and surveillance cameras are a constant presence.
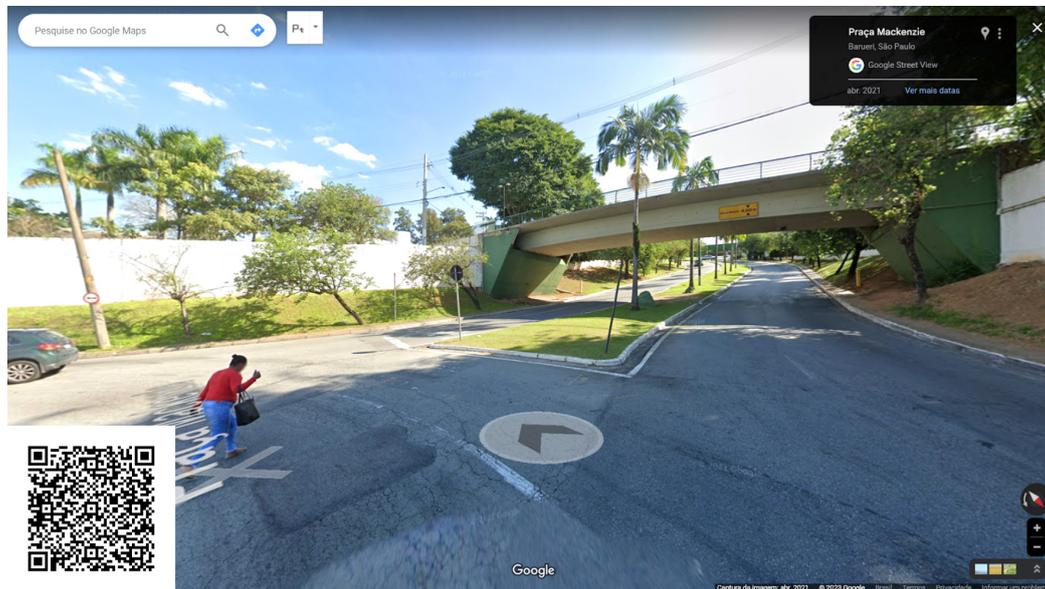

Figure 9. The situation on Av. Mackenzie, Alphaville, Barueri, in April 2021
Source: Google Street View. Available at: https://maps.app.goo.gl/CxvEysmfhnGMdvmB9?g_st=ic. Accessed on: February 27, 2025.

Due to the size of such developments, which cover an area comparable to that of a neighborhood, both pedestrian and vehicle accessibility across the city are hindered by the uninterrupted enclaves, even when intersected by public highways and connected by private overpasses (Figure 9). The image depicts a private overpass linking two sections of a gated community, with its blank walls running along the public highway, devoid of sidewalks for pedestrians to cross. As seen in previous examples, the avenues connecting the gated communities to the rest of the urban fabric, by passing through their continuous barriers and leading to their entrances, result in deserted corridors that lack any sense of urbanity, even within the city itself (Figure 10).

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22. GOOGLE. Street View image of the situation on Alameda Purús, Alphaville, Barueri, em dezembro de 2022. Available at: https://maps.app.goo.gl/VcT2SSyAsAtgyUBk8?g_st=ic. Accessed on: February 27, 2025.

23. GOOGLE. Street View image of the situation on Alameda Araguaia, Alphaville, Barueri, em junho de 2023. Available at: https://maps.app.goo.gl/o4gGFjtawEp5ZkVE9?g_st=ic. Accessed on: February 27, 2025.

24. GOOGLE. Street View image of the situation on Avenida Alphaville, Alphaville, Barueri, em dezembro de 2022. Available at: https://maps.app.goo.gl/uT9kBeSCNutvJhBR7?g_st=ic. Accessed on: February 27, 2025.
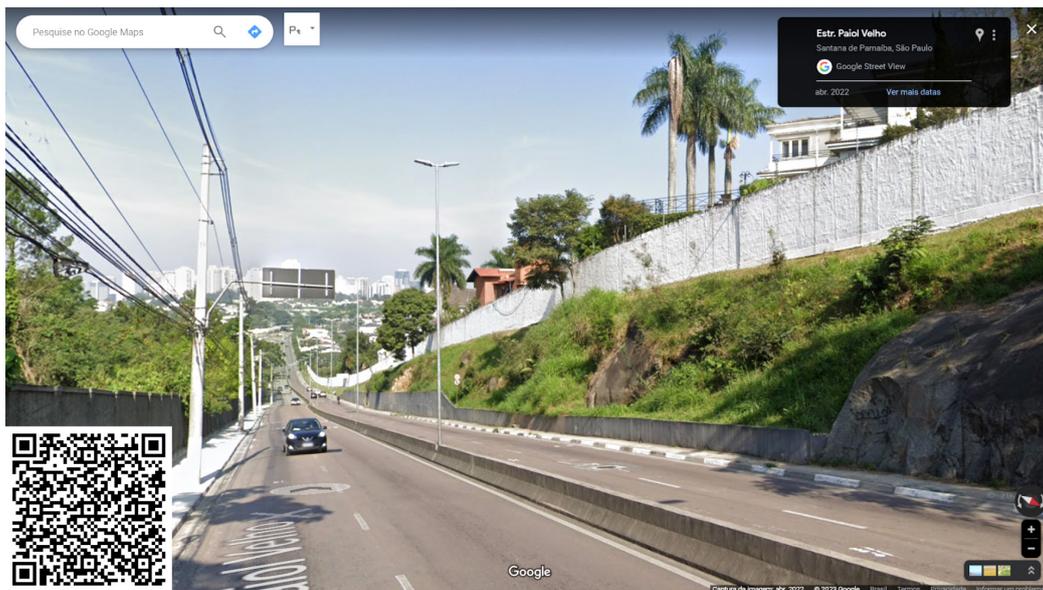
Figure 10. The situation of the Estrada Paiol Velho, Tamboré, Santana de Parnaíba, in April 2022
Source: Google Street View. Available at: https://maps.app.goo.gl/WbbyUnfqkHrfrPFL9?g_st=ic. Accessed on: February 27, 2025.

Given these examples of security devices and segregation measures, which manifest, in various forms and intensities across different socioeconomic layers and construction standards, highlighting situations of inequality in multiple dimensions (economic, infrastructural, and mobility), the material relationship between hostile protection strategies and socio-spatial segregation becomes fully evident. Through these devices, configurations, and socio-spatial relations, we may observe the particularities of Brazilian peripheral territories, such as the western portion of the SPMA, even in areas with either homogeneous or heterogeneous populations and construction standards.

4. Reflections on individualism in the urban space under study

In the urban context, by traveling along the public roads that border these complexes, the material expression of this inequality becomes evident in the segregating measures of the condominiums. While in the studied neighborhoods poor urban infrastructure or the closure of alleyways at certain hours ultimately restricts accessibility, the situation is even more pronounced in clusters of contiguous gated communities, where the only spaces between them are highways.[25] Here, security measures that separate neighborhoods and obstruct

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25. GOOGLE. Street View image of the situation on Estrada de Ipanema, Jardim Paula, Santana de Parnaíba, in December 2022. Available at: https://maps.app.goo.gl/uepeJvbjAXVe6gQq7?g_st=ic. Accessed on: February 27, 2025.

pathways also impact urban mobility. This issue has been highlighted in media reports, with cases of communities having their access routes to other parts of the city blocked by condominium walls as part of public works projects (Barueri na Rede, 2016). The press has also documented how "urban services are provided to high-income groups to supply newly built gated communities, yet they rarely reach lower-income communities for whom public transportation is an essential service" (Barros; Batty, 2016). These overlapping dimensions of everyday reality reveal "the fragmentation and segmentation of the urban fabric," resulting in "disparities in infrastructure and service levels" caused by this model of private development (Koch, 2008, p. 100).

These measures are not solely individual; they are sometimes applied collectively or integrated into security systems. Nor are they homogeneous or uniform, since they occur in distinct situations, even though they may be structural to certain urban deployments and configurations. However, they are often perceived as individualistic, in the sense that an individual "thinks, feels, and acts according to their own interests, with little regard for the social context in which they find themselves" (Gouveia et al., 2003, p. 224). This perception, however, may be justified by inequality or feelings of fear and insecurity. To understand this, it is necessary to "recognize that individualism and collectivism are not necessarily opposing extremes. People embody both to varying degrees, and often, it is the context, the immediate situation, that determines the most appropriate style of behavior" (Gouveia et al., 2003, p. 224).

As Ângela Buciano do Rosário observed in her review on the work of Castel (2005), "modern societies are built on the foundation of insecurity, since they do not find within themselves the capacity to ensure protection" (Rosário, 2005, p. 185). Thus, in a society centered on the individual, "protection is no longer provided by the group to which one belongs, but rather one's property. It is property that guarantees security in the face of life's uncertainties" (Rosário, 2005, p. 185). Kowarick (2017, p. 95) also links this "primacy of the private citizen" to the image of homeownership, which, in the Latin American context, "constitutes a refuge with predominantly defensive characteristics in metropolises shaped by industrialized underdevelopment, in which the transformation of public space is increasingly defined as an inherently exclusionary and violent domain". Caldeira (2000, p. 11) links these measures to a deepening distrust in the public sphere, which undermines the democratic city, where "citizens increasingly rely on private security and private enclaves, structuring their daily lives in ways that exclude public services and authorities, thereby delegitimizing them". Rocha and Eckert (2013, p. 131) suggest that, within the neoliberal framework, this "preference for individual protective

action aims to minimize the perceived threat of danger, reflecting a reconstitution of trust through market mechanisms at the expense of public and civil institutions' credibility." As the authors aptly summarize, in an urban context marked by hostile elements and attitudes, space ceases to foster collective civic virtues and instead reinforces individualism.

Final considerations

This analysis has thus demonstrated how security protective devices are embedded in the very processes of urban space production. As the survey moved from central areas toward the peripheral regions of the western sub-region of the SPMA, similar patterns were observed in many residences, marked by the presence of high walls, metal bars, barbed wire, and electric fences. While the initial scale of using these security devices has varied over time, residences have increasingly equipped their enclosures to match those of their new neighbors, as buildings began to occupy previously vacant lots. The proliferation of security devices thus follows a gradual, cumulative pattern: once a device has been implemented in a building, similar measures tend to appear in neighboring buildings. Street View images, combined with cadastral and census data, indices, and geoprocessing information provided by municipalities, indicate that over the past decade, this model has expanded across remaining lots in these cities. In areas still awaiting future developments, such patterns suggest possible processes of speculation, gentrification, and displacement of lower-income populations. Moreover, It is also evident that the design of new or renovated residential buildings and complexes in these neighborhoods, whether for low- or middle-income groups, including those under housing promotion programs, tends to reinforce spatial isolation, with ostensive security measures and reduced interaction with public streets.

Through examples of individualistic segregation measures in the western sub-region of the SPMA, this study has demonstrated how the production of a segregated urban space unfolds in everyday practices on an individual level, through streets that are either open and accessible or restricted to the population, at the thresholds between an ostensibly protected space and a purportedly dangerous one. It becomes evident that protective and security devices are implemented not only in areas of socioeconomic contrast, but also in homogeneously affluent areas, such as private security guards in middle- and upper-income neighborhoods. These devices often become integral to their own processes of production. From metal bars in low-quality constructions or high-end condominiums enclosed by walls long before the residential units are even built, individualistic behaviors are thereby inscribed into collective space. Notwithstanding, in contexts of socioeconomic

disparity – whether in heterogeneous populations or neighborhoods with varying levels of infrastructure – these measures tend to intensify. High-end condominiums rise alongside lower-income communities, while social housing programs are placed in proximity to areas of higher or lower income, thus accentuating social inequalities in a more pronounced manner as these populations fragment and isolate themselves within the urban fabric.

The segregation measures analyzed clearly demonstrate their deep integration into the everyday life of cities. Thus, similar urban space elements were identified across various contexts, with the examples selected reflecting a vast range of comparable cases, given the recurrence of these phenomena throughout the study. Additionally, as previously established, the adopted methodological approach enabled this habitual nature to be recognized, thus reaffirming the extent to which segregated urban space is perceived as a commonplace reality.

Through these technological tools – specifically, the use of Street View images in this study – knowledge and experiences become accessible to a wide range of people, enabling an empirical analysis of urban materiality that is easily shareable, and thus enhancing its scientific dissemination. This sharing process, which respects and incorporates diverse sensitivities, while encouraging new perspectives, is further enriched by the use of hyperlinks and QR codes, providing a more direct, tangible connection to the data. This approach aids the discussion and reflection on socio-spatial segregation, promoting interaction with these visual data. The comparison of images over time also enables the assessment of changes and the identification of trends when these visual overlays are complemented by other supporting data.

The indifference with which city dwellers navigate fear, insecurity, and inequality further reinforces their coexistence with sociospatial segregation and the myriad issues it entails. However, it is in examining these forms of coexistence – paradoxically designed to avoid contact with what is different – that the unsustainability of segregating models and measures becomes apparent. By focusing on socio-spatial relationships, rather than isolated elements, we can better understand how the effects of segregation, at various levels and scales, impact both sides of the divide, both within and beyond the walls.

The city transcends the boundaries that divide it, for space, as a social construct, is never confined or isolated from the processes that have shaped its production, from the networks of matter and labor that both conceived and sustain it. Urban space is not stagnant; on the contrary, it exists in the present and can be traced throughout time.

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Luiz Gonzaga Philippi Filho

Master's degree in Architecture and Urbanism from the Postgraduate Program in Architecture and Urbanism (PósARQ) at the Universidade Federal de Santa Catarina (UFSC) and graduated in Architecture and Urbanism from the same university. He was a resident on the Specialization Course for Technical Advisory in Social Housing (ATHIS) at UFSC. He is a professor on the Architecture and Urbanism programs at Unisul and UniSociesc.

Email: zagaphilippi@gmail.com

ORCID: 0000-0003-0962-8323

Authorship contribution: Conception; Data Curation; Formal Analysis; Investigation; Methodology; Writing – Original Draft; Writing – Review and Editing.

Adriana Marques Rossetto

Postdoctoral researcher at the Instituto de Urbanismo de Grenoble (IUG) at Université Grenoble Alpes. Doctorate in Production Engineering, concentrating on Environmental Management, from the Universidade Federal de Santa Catarina (UFSC), and a Master's degree in Civil Engineering from the same university. Graduated in Architecture and Urbanism from the Universidade Federal de Pelotas (UFPel). Associate Professor at UFSC, permanent faculty member on the undergraduate Architecture and Urbanism program, the Specialization in Technical Assistance for Social Housing (Athis), the Postgraduate Program in Architecture and Urbanism, and in the Professional Master's program in Natural Disasters.

Email: amarquesrossetto@gmail.com

ORCID: 0000-0002-7785-9599

Authorship contribution: Conception; Data Curation; Formal Analysis; Investigation; Methodology; Supervision; Writing – Original Draft; Writing – Review and Editing.