

Evaluating Public Space Land Allocation through Inequality.

Public Space and Socio-spatial Differentiation in Curitiba, Brazil

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Abstract

Public space is a fundamental component of urban life, supporting social interaction, collective activities, and democratic coexistence. However, its distribution within cities is uneven, often reflecting and reinforcing socio-spatial inequalities. A key challenge in public space research is developing methods that link its physical availability to broader socioeconomic conditions. This article addresses this issue by examining the relationship between the land allocation of public space and household income in Curitiba, Brazil. The study builds on the development of the Public Space Coefficient (PSC), an indicator that measures the proportion of physical public space - streets, squares, and parks - relative to the total area of a given territorial unit. Using census data and intra-urban divisions, the PSC is compared with income levels to identify patterns of social and spatial inequality. The results show that the relationship between public space and income is not absent but varies by the type of space considered. While streets are widely distributed and dominate the aggregate indicator, they primarily reflect basic urbanization conditions, masking deeper inequalities. In contrast, squares exhibit a stronger association with income levels, with lower-income areas showing significant deficits. Parks, although unevenly distributed, are more influenced by territorial constraints than by socioeconomic patterns. These findings demonstrate that aggregate measures of public space can hide structural inequalities if different types are not examined separately. The study emphasizes that public space allocation should be understood as an unevenly distributed urban resource, and that disaggregated indicators are essential for revealing socio-spatial disparities. By linking spatial metrics to social variables, the article contributes to the development of more precise analytical tools and supports more equitable urban planning strategies.

Keywords: public space evaluation, socio-spatial inequality, public space land allocation, urban indicators, Curitiba

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In most Western cities, public space is a defining element of the urban fabric, making it difficult to conceive of any urban settlement without it, as Kostof (1991) notes. However, its distribution across the urban territory is not uniform, and thus public space holds significant potential as an indicator of social and spatial inequality. Although this assumption is often taken for granted, there remains a lack of studies that systematically map this spatial correspondence.

In contrast, the presence and distribution of urban facilities - such as schools - have been widely examined to understand the territorialization of social vulnerability. Ribeiro et al (2016), for example, provide an overview of how social organization in metropolitan territories is shaped, particularly regarding the educational impacts on children and youth resulting from the spatial distribution of school infrastructure. This perspective is directly informed by the work of Kaztman (2001), who investigates the mechanisms that sustain the unequal integration of the urban poor into society, often manifested as social isolation. According to the author, one of the key processes underlying this condition is the progressive reduction of public spaces - sites where recreation and collective leisure can foster informal interactions among individuals from different socioeconomic backgrounds, potentially mitigating the effects of asymmetric social structures.

In this context, these studies provide the foundation for the present article, which aims to demonstrate how the distribution of public space relates to spatial patterns of inequality, as measured through income indicators. The main argument is that certain types of public space may be more closely associated with socio-spatial segregation. According to Maricato (2003), inequality and social exclusion can be assessed through multiple dimensions, including informality, poverty, low levels of education, and limited access to citizenship. In this sense, public space can be added to this set of indicators, with its spatial absence serving as a potential marker of inequality. It is acknowledged, however, that the mere presence of public space does not guarantee its equitable, safe, or effective use, as qualitative aspects must also be considered. Furthermore, different types of public spaces enable distinct forms of appropriation; nonetheless, their existence is essential for fostering empathy and solidarity, which help shape society's sociocultural fabric.

This article is part of an ongoing research agenda aimed at understanding the distribution and quality of public space in Curitiba and its relationship to socio-spatial inequality. The research process has progressed through successive stages, beginning with a quantitative, spatial assessment of public space allocation in the city (Rosaneli, 2021) and an initial exploration of its relationship to income indicators (Rosaneli et al, 2017). Building on these earlier contributions, the present article advances the discussion by applying the Public Space Coefficient (PSC) as a socio-spatial indicator and examining its association with income distribution patterns across the municipality. In this sense, the article represents a further step in the development and testing of an analytical framework intended to support public policies aimed at improving human settlements, positioning public space as a key element of everyday urban life. To achieve this, the article begins with a brief conceptual discussion that defines the notion of public space adopted here, followed by a description of the methodology and the presentation of the results.

A Particular Approach to Public Space

The growing and widespread interest in issues related to public space over recent decades has been highlighted by many scholars. Mehta and Palazzo (2020) argue that, in an

increasingly urbanized and heterogeneous world, there is little doubt regarding the relevance and resurgence of this agenda, which has been addressed in an expanding body of literature (Madanipour, 2019), even if it sometimes causes a certain “disorientation” (Rosaneli, 2019). Mitchell (2017) identifies the 1990s as a turning point in this scholarly work, due to the political and economic transformations experienced globally, particularly in the context of “neoliberalization” (Peck, Theodore and Brenner, 2012).

The socio-spatial relevance of the material expression of public space has been described as “a key component in the urban vocabulary” and as something that is “in the DNA of urban life” (Madanipour, 2020, p. 7). Public spaces are thus central to everyday life, as they constitute “prominent sites for advancing political issues, due to their accessibility, openness, and symbolic significance,” becoming spaces that are “essential for democracy and collective well-being, a resource that [...] becomes the stage and substance of struggle, negotiation, and ultimately, care” (Low, 2023, p. 24). However, the importance of the common domain extends beyond political life. Mehta (2023, p. 171) argues that public spaces hold a unique capacity to address the three major global crises - climate emergency, social injustice, and public health - since they can be conceived as spaces of “restoration, emancipation, and healing.”

At the same time, public space has also been mobilized within a “promotional rhetoric,” becoming an “instrument for investment returns and profit maximization” (Madanipour, 2019, p. 39), serving processes of urban reappropriation by real estate capital and undermining its political essence in favor of a civic-oriented ideology (Delgado, 2011). Despite these risks, this broader perspective supports the argument that public space can be understood as a “visible ethical compass of society” (Mitrašinović and Mehta, 2022), a “cluster concept” (Kohn, 2004), and a means to achieve socio-spatial justice in multiple dimensions (Low and Iveson, 2016). In other words, it constitutes a fundamental spatial category for understanding contemporary urban life and an essential tool for promoting more just, inclusive, equitable, healthy, innovative, and sustainable cities.

For the purposes of this study, public space is understood as a public good, grounded in its material dimension and generally regulated by legal frameworks that govern social, personal, and property relations, such as ownership and contracts. In Brazil, the Brazilian Civil Code (Articles 98 and 99) establishes the category of “assets for common use of the people,” including beaches, streets, squares, and parks. Although this is a restrictive definition given its juridical nature (Konzen, 2010), it allows the identification of a typical set of public spaces commonly found in Western cities.

In this context, Curitiba, one of the 15 metropolises in Brazil (IBGE, 2020), does not differ significantly from its national counterparts, despite being a Brazilian municipality with a consistent history of achievements in urban planning and management, as can be seen in the recent research for the 5.570 Brazilian municipalities (Wilm *et al*, 2026). However, according to a major international study examining the complex social, political, economic, and cultural dynamics of urban environments, Curitiba was ranked among the 20 most unequal cities worldwide (UN-Habitat; Instituto de Pesquisa Econômica Aplicada, 2010). The structuring of this socio-spatial inequality is closely linked to the process of metropolitan expansion that began in the 1970s and was shaped by public policies and planning decisions. This situation stems from the implementation of the 1966 Comprehensive Plan, which profoundly transformed Curitiba’s urban development model. The plan adopted a linear pattern of urban expansion structured around major transport corridors, concentrated vertical development along these axes, and incorporated

innovative policies for urban planning, environmental protection, and the creation of public spaces that gained considerable international recognition. It may be argued that this spatial model remains in force to the present day, despite several revisions to urban planning legislation over the years. Although some authors have suggested that these initiatives contributed to the construction of urban myths (Oliveira, 2000), subsequently amplified through political marketing strategies (Garcia, 1997), it seems undeniable that the historically established public spaces have placed Curitiba in a privileged position within the Brazilian - and even Latin American - urban context. Furthermore, many of these public spaces continue to exhibit a remarkable and enduring level of collective appropriation, a condition that remains relatively uncommon in Brazilian cities. However, Souza (2001) argues that Curitiba's urban planning model contributed to granting locational advantages to middle- and upper-income groups, displacing lower-income populations to the urban periphery and, especially, to neighbouring municipalities. More recent research by Moura and Firkowski (2014, p. 30) indicates that "urbanization concentrated population, economic activity, and income generation, particularly linked to industrial development, following broader transformations in the productive structure." As a result, in Curitiba, higher occupational categories remain concentrated in central areas, while middle-income groups occupy peripheral neighbourhoods. Meanwhile, informal housing has intensified through the densification of consolidated informal settlements, often located near socially distinct residential areas. These dynamics reveal a pattern of increasing residential segregation in Curitiba, even as the traditional centre-periphery model becomes more heterogeneous.

Methodology

The Public Space Coefficient (PSC) was conceived as a spatial indicator with broad potential for replication in the Brazilian context and, possibly, in Western cities more generally, as discussed in Rosaneli (2021). Due to its simple, quantitative, objective, relative, and descriptive nature -focused on measuring resource availability - it can be easily calculated as the ratio of the total area of all types of public spaces to the total area of a given territorial unit.

With values ranging from 0 to 1, this dimensionless measure can be used to compare different territorial realities, enabling the identification of both the presence and distribution of public space. It was conceived as a practical instrument of measurement, relying exclusively on secondary data sources and requiring no fieldwork. In the case of Curitiba, publicly available datasets were used across different spatial units, including census tracts, neighbourhoods, and Human Development Units (HDUs) - territorial divisions based on the similarity of socioeconomic conditions among census tracts, as illustrated in Figure 1. Public spaces were grouped into three main categories for comparative grading: streets, squares, and parks, primarily to facilitate visualization and, in some way, to reflect the processes of creating public space in Brazilian cities. In this sense, it has some conceptual limitations, particularly because these spaces serve distinct urban functions in mobility, sociability, recreation, and environmental quality.

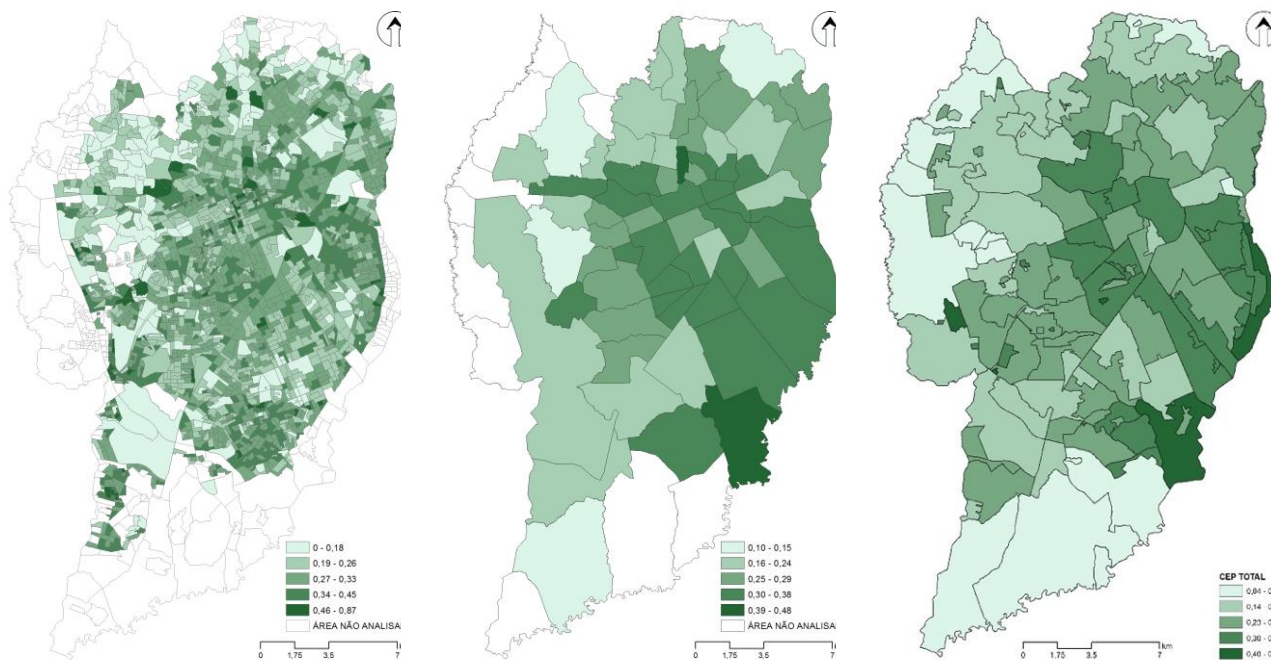


Figure 1. Maps of the municipality of Curitiba showing the PSC (total), divided into five classes (Jenks natural breaks) for census tracts (a), neighbourhoods (b), and HDUs (c). Source: Rosaneli (2021).

The use of territorial units as a visual framework for spatial data enables comparison with other indicators, particularly those that incorporate social variables such as income, education level, and gender. These data are typically collected and organized by public agencies responsible for geographic information, such as the Brazilian Institute of Geography and Statistics (IBGE).

Although social indicators are often more dynamic than spatial ones - posing a temporal challenge for data alignment - and differ in nature, their comparison can reveal important insights into the conditions of urban space production and consumption. To do this, a linear normalization of values was applied, converting the data into a common scale. Equal-interval thresholds were defined for both the Public Space Coefficient (PSC) and per capita income: low (0–0.33), medium (0.33–0.66), and high (0.66–1).

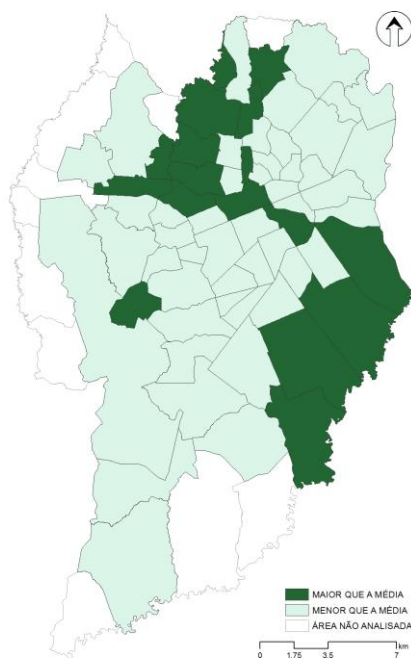
Socioeconomic data were obtained from the 2010 Demographic Census conducted by the IBGE and compiled at the HDUs level, based on work developed by the United Nations Development Programme (UNDP), the Institute of Applied Economic Research (IPEA), and the João Pinheiro Foundation (FJP). The choice of per capita income as the main indicator is justified by its use in the composition of the Human Development Index (HDI) and its capacity for immediate synthesis, despite its well-known limitations as an average measure calculated over a given period.

For visualization, spatialization was performed using the Jenks natural breaks classification method, divided into five classes. To analyse income distribution, a cluster analysis was conducted, generating a similarity matrix based on Euclidean distance — the straight-line distance between two points. This procedure grouped similar values (high or low) and highlighted spatial outliers. It is important to note that this initial exploratory analysis,

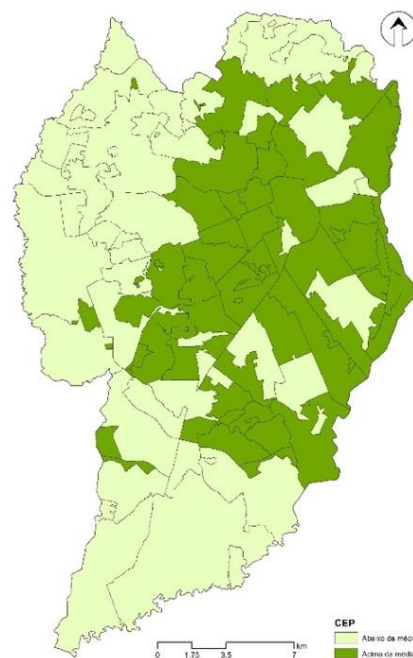
based on clustering by spatial similarity, has methodological limitations, and a more refined statistical approach that accounts for spatial autocorrelation and spatial regression could strengthen the conclusions. However, its advantage lies in the ease of data processing, which enables its use in formulating or correcting public policies in different administrative contexts. Finally, to correct, rephrase, and proofread the final document, Grammarly IA tools were used.

The Spatialisation of Inequalities

In Curitiba, public space is neither equally present nor uniformly distributed across the urban territory. A clear way to illustrate this inequality is to divide PSC (total) values into those above and below the average, as shown in Figure 2. This distinction highlights that the municipal periphery is generally the least well served in terms of public space land allocation, except in the eastern part of the city. This concentration in the eastern area can be explained by urban conurbation, characterized by an extensive street network, as well as by the presence of a linear park along the Rio Iguaçu, which runs along the municipal boundary and is recognized as one of the largest urban park systems in Brazil.



Source: Rosaneli (2021).



Source: Rosaneli et al (2017).

Figure 2. Maps of the municipality of Curitiba showing the PSC (total), spatialized into two classes (above and below the mean) for neighbourhoods (a) and HDUs (b).

When observing the spatialized data for Human Development Units (HDUs), the PSC (total) reaches 0.213, with PSC (streets) at 0.177, PSC (squares) at 0.007, and PSC (parks) at 0.029. For neighbourhoods, the values are as follows: PSC (total) 0.253; PSC (streets) 0.211; PSC (squares) 0.008; and PSC (parks) 0.034. Despite numerical variation, there is a

proportional consistency among the different PSC components across both territorial units. Therefore, the choice of spatial units for studies in other municipalities should consider data availability and accessibility.

An attempt to better contextualise these values is to compare them with findings from a UN-Habitat (2013) study that analysed more than 100 cities worldwide. The report indicates that, despite regional differences, cities in Africa, Asia, and Latin America and the Caribbean tend to have the lowest proportion of land allocated to streets - about 15% in central areas and 10% in peripheral zones. In this context, the PSC (streets) values observed in Curitiba can be considered relatively favourable compared with the global averages reported in that study for both neighbourhoods and HDUs.

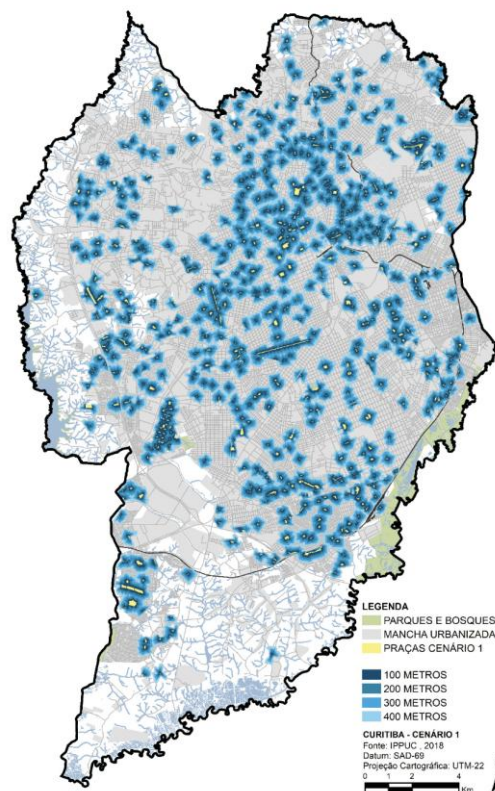


Figure 3. Square coverage map, with distance buffers of 100, 200, 300, and 400 meters.
Source: Oenning (2019, p. 96)

A limitation inherent to this type of indicator arises from the artificial nature of the territorial base on which it is constructed, particularly when census units - originally designed to measure population - are used. Moreover, such indicators cannot capture the actual service area of certain types of public spaces, like squares and parks, because administrative boundaries do not reflect how these spaces are experienced in daily life. To address these conceptual limitations, Oenning and Rosaneli (2020) propose a specific coverage calculation method for squares, which estimates their spatial reach and the population they serve based on walking distances. It is important to note that one of the premises of this study was to consider only squares that allow some form of public use.

Two scenarios were developed: first, the exclusion of squares incorrectly registered by public authorities, which reduced the dataset by approximately 33% (Figure 3); and second, a more restrictive scenario excluding squares lacking adequate conditions for public use, resulting in the removal of 47% of the total.

The spatial distribution shown in the map indicates a greater concentration of squares in the central areas of Curitiba, alongside a more dispersed pattern in peripheral zones, except for a notable concentration in the southern region, corresponding to more recently developed neighbourhoods. Overall, at distances up to 400 meters, approximately 44.55% of the territory is served by squares. Despite this coverage, the distribution of public spaces remains uneven across the urban territory. Thus, both analytical approaches (Rosaneli, 2021, and Oenning, 2019) point to similar spatial patterns in Curitiba.

On another analytical level, comparing social indicators with the PSC provides insights into the population's ability to access shared public spaces. By analysing the link between the resident population and the area of HDUs, as shown in Table 1, it becomes clear that the HDUs with higher PSC (total) values - making up 71% of the units - hold the majority of the municipal population (83%), even though they occupy a smaller part of the land (59%). This indicates that although the distribution of public space is uneven, most of Curitiba's residents can access some form of public space, especially streets.

Table 1. Classification of PSC (total) into ranges, indicating absolute number of units, total resident population, total HDU area, and population density.

Source: Rosaneli et al. (2017).

Classification	HDU	%	Total Population	%	Total Area (ha)	%	Population Density (inhab./ha)
High PSC	55	41%	744.919	47%	12.108	28%	61,53
Medium PSC	40	30%	570.708	36%	13.403	31%	42,58
Low PSC	38	29%	256.921	17%	17.978	41%	14,29
Total	133	100%	1.572.549	100%	43.489	100%	36,16

For the central analysis of this article, it is important to highlight some initial considerations regarding the variables used: per capita income and public space. Income dynamics are often more volatile than spatial dynamics because they are influenced by macroeconomic factors (such as inflation, earnings fluctuations, tax exemptions, etc.) and microeconomic conditions (such as savings, indebtedness, and changes in household composition), leading to variations in average growth rates. In contrast, urban form—especially in relation to the creation of public spaces, which is even more limited in cities of the Global South - tends to change more slowly. For example, according to the revision document of the Curitiba Master Plan prepared by the Instituto de Pesquisa e Planejamento Urbano de Curitiba (2026, p. 389), the compound annual growth rate of “green leisure areas” was 1.51% per year (between 2014 and 2025). Therefore, in general, territorial units tend to maintain relatively stable PSC values over time, while income shows greater variability. However, studies by Oxfam Brasil (2017, 2024) indicate that economic inequality in Brazil remains persistent.

To address this fundamental asymmetry, a temporal adjustment was applied to both dimensions to align the datasets: for PSC and income, data from 2010 were used. Following linear normalization, the income variable was classified into three ranges: low (R\$ 439.73 to R\$ 1,349.09), medium (R\$ 1,397.90 to R\$ 2,206.36), and high (R\$ 2,272.42 to R\$ 4,645.60). Within this framework, 68% of the HDUs in Curitiba fall into the low-income category, covering 58% of the population and 64% of the territorial area. This pattern is typical of Brazilian cities, where high-income areas tend to exhibit higher densities (often associated with verticalization), while low-income populations occupy lower-density zones due to urban sprawl. The spatial distribution presented in Figure 4, based on the data from Table 2, reveals a concentration of income in the central area and extending toward the northern region of the municipality. This trend becomes more evident when compared with the similarity-based clustering map (Figure 5), which highlights spatial groupings of units with similar values. In this case, a cluster of 19 high-income units appears in the aforementioned region, with an average income of R\$ 3,350.00. At the opposite extreme, a cluster of 10 units in the southern part of the municipality exhibits low income, with an average of R\$ 561.00.

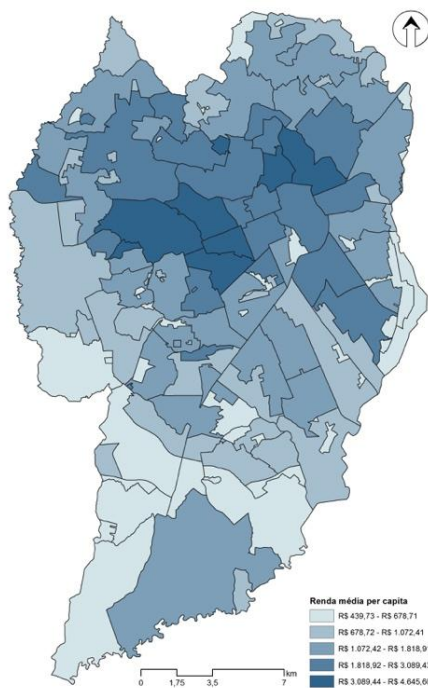


Figure 4. Map showing the distribution of average per capita income across HDUs in the municipality of Curitiba, classified into five intervals (Jenks natural breaks).
Source: Rosaneli et al (2017).

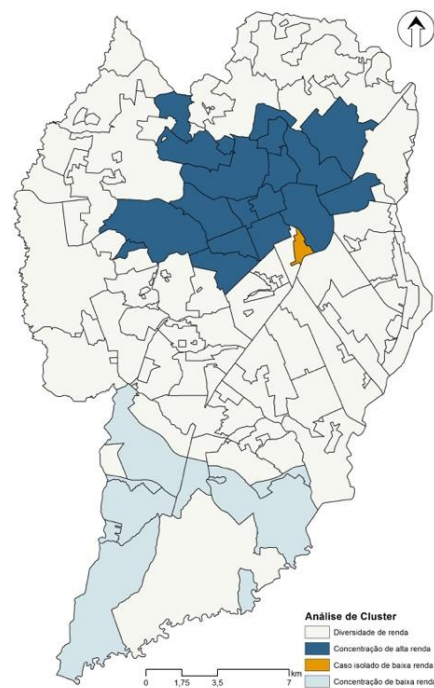


Figure 5. Map illustrating the distribution of average per capita income across HDUs in the municipality of Curitiba, grouped by similarity.
Source: Rosaneli et al (2017).

Table 2. Distribution of HDUs, population, and area by income classification and its subdivisions, related to street presence. Source: Rosaneli et al. (2017).

Classification	HDUs	%	Population	%	Area (ha)	%
High income	21	16%	336.914	21%	7.281	17%
Medium income	21	16%	318.408	20%	8.176	19%
Low income	91	68%	917.227	58%	28.032	64%
Total	133	100%	1.572.549	100%	43.489	100%

For the analysis of the relationship between income data and public space, the study was based on a hypothesis derived from the adopted theoretical framework - namely, that there is a correspondence between a locality's level of social development and the availability of urban infrastructure. Accordingly, if the distribution of public space in Curitiba follows this hypothesis, HDUs with higher average per capita income should also present a greater availability of such spaces, and vice versa. To broaden the understanding of this phenomenon, the analysis was structured into four dimensions, based on the PSC (total) and on the disaggregation of its components: streets, squares, and parks.

Regarding the relationship between street presence and income levels, a consistent pattern of inequality in urban structure becomes clear. In high-income HDUs, there is a high level of connectivity and urban fabric consolidation. In contrast, low-income HDUs exhibit a more dispersed distribution, indicating lower infrastructure density and potential accessibility limitations. A key figure illustrates this pattern: among residents in high-income HDUs, only 1% live in areas with low street presence, compared with 15% in middle-income HDUs and 25% in low-income HDUs. These findings suggest that street presence is directly associated with income levels, reinforcing the link between higher income and better conditions of connectivity and territorial development.

The analysis of the relationship between the presence of squares and income levels reveals a clearer pattern of inequality in the allocation of public space. In high-income HDUs, although the total number of squares is relatively low, there is a strong concentration at intermediate levels, indicating a more balanced and qualitatively structured supply. In contrast, middle- and especially low-income HDUs are mainly characterized by low availability of squares. High levels of square land allocation are residual across all income groups, but they are particularly scarce in middle-income areas and limited in low-income areas. These findings show that the distribution of squares is fundamentally unequal, with greater shortfalls in lower-income areas, reinforcing the link between socioeconomic vulnerability and reduced access to spaces for social interaction and leisure.

Regarding parks, given their historical and geographical concentration, the data reveal a markedly uneven distribution, generally characterized by a predominance of low availability across all socioeconomic strata, but with a particularly pronounced absence in lower-income areas. In relative terms, higher levels of park allocation remain residual across all groups, though they are also present in lower-income areas. Unlike the pattern observed for streets, the limited presence of parks appears to be a structurally widespread condition in the city, affecting all income levels, but with greater intensity and territorial extent in middle- and low-income areas, thereby reinforcing inequalities in the distribution of this larger-scale, environmentally significant public space.

Finally, when considering the aggregate of all public spaces through the PSC (total), the comparison with income - presented in Table 3 and visualized in Figure 6 - reveals a pattern strongly conditioned by the dominance of streets. Streets account for 83% of the total ($PSC = 0.177$ out of 0.213), decisively shaping their territorial distribution and, consequently, masking more nuanced inequalities observed in other types of public space. In high-income HDUs, there is a strong concentration in higher PSC levels, with 57% of the units accounting for 76% of the population and 52% of the total area. This indicates a strong association between higher income and greater relative availability of public space, although this result is directly linked to the high prevalence of street infrastructure. In middle-income HDUs, intermediate conditions predominate (52% of units, 68% of the population, and 71% of the area), suggesting a more balanced pattern of urbanization, albeit still largely dependent on the street network. In low-income HDUs, a more heterogeneous distribution is observed, with a significant presence in both high PSC areas (41% of units and 44% of the population) and, more notably, in low PSC areas, which account for 56% of the total area within this income group. This indicates that although a substantial portion of the low-income population is located in areas with higher PSC levels, there remains a substantial territorial area with limited public space allocation. Thus, because the PSC is predominantly composed of streets, it tends to reflect the capillarity of the road network rather than the supply quality of open public spaces. As a result, it may attenuate or obscure deeper inequalities related to the distribution of squares and parks, particularly in lower-income areas.

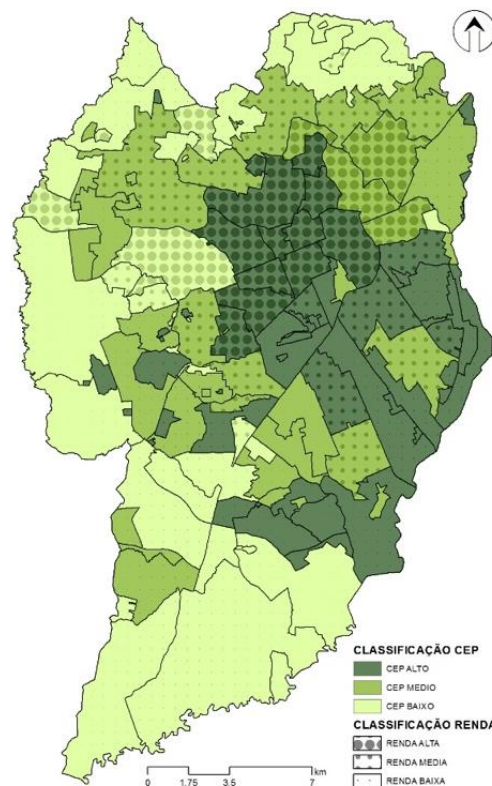


Figure 6. Map illustrating the spatial relationship between per capita income and PSC (total) in the municipality of Curitiba. Source: Rosaneli et al (2017)

Table 3. Distribution of HDUs, population, and area by income classification and its subdivisions according to the Public Space Coefficient (PSC).

Classification	HUDs	%	Population	%	Area (ha)	%
HIGH INCOME	21	16%	336.914	21%	7.281	17%
High PSC	12	57%	254.430	76%	3.790	52%
Medium PSC	4	19%	56.552	17%	1.801	25%
Low PSC	5	24%	25.933	8%	1.691	23%
MEDIUM INCOME	21	16%	318.408	20%	8.176	19%
High PSC	6	29%	91.110	29%	1.915	23%
Medium PSC	11	52%	215.390	68%	5.769	71%
Low PSC	4	19%	11.909	4%	492	6%
LOW INCOME	91	68%	917.227	58%	28.032	64%
High PSC	37	41%	399.380	44%	6.403	23%
Medium PSC	25	27%	298.768	33%	5.833	21%
Low PSC	29	32%	219.080	24%	15.796	56%
Total	133	100%	1.572.549	100%	43.489	100%

Based on the data presented, it is plausible to argue that squares constitute a more sensitive and revealing indicator of socio-spatial inequality than streets and parks, provided that this claim is accompanied by appropriate analytical qualifications. First, streets exhibit a relatively capillary distribution across the urban territory and account for the largest share of the PSC (total). As a result, this indicator is strongly influenced by an infrastructure that, although unequal in quality, is nearly universal in physical presence. This reduces its capacity to discriminate finer differences across income groups, functioning more as a basic indicator of urbanization than of equity in the allocation of qualified public space.

By contrast, parks rely on specific conditions for their implementation - such as the availability of large land parcels, environmental constraints, and planning regulations - which makes their distribution less directly associated with the everyday socioeconomic dynamics of urban space production and more linked to structural territorial factors. Therefore, although relevant, parks do not consistently capture inequalities in the everyday availability of public space.

Squares, however, occupy an intermediate - and therefore more strategic - position. As smaller-scale spaces embedded within the everyday urban fabric and more directly connected to residential areas, they are more closely tied to daily urban life. The data show that their low availability is strongly concentrated in middle- and low-income areas, in terms of number of units, population, and especially territorial extent, revealing a clearer pattern of unequal distribution. Unlike streets, they are not universalized, and unlike parks, they do not depend on exceptional conditions to exist.

In this sense, squares tend to more directly reflect public investment decisions, planning priorities, and the historical patterns of urban space production. As a result, they serve as a particularly effective indicator for revealing inequalities in the presence and distribution of public spaces dedicated to everyday social interaction, leisure, and sociability.

Final Considerations

Brazilian metropolitan areas materialize deep socioeconomic inequalities in their territorial configuration. This study has sought to demonstrate that public space, beyond its physical and functional dimensions, also constitutes a concrete expression of these inequalities. The case of Curitiba is particularly relevant to this discussion, given its historical recognition in urban planning, which would, in principle, suggest a more equitable distribution of urban resources.

The analysis shows that the relationship between public space and income cannot be fully understood through aggregate terms. When considered as a whole, the Public Space Coefficient does not exhibit a significant connection with income levels, a result largely influenced by the predominance of streets in its composition. In this sense, the aggregate indicator tends to reflect the capillarity of the road network, functioning more as a measure of urbanization rather than a sensitive indicator of socio-spatial inequality.

However, when the indicator is disaggregated and its components are examined separately, clear patterns of inequality become apparent. While streets are widely distributed across the urban territory and parks are shaped by specific territorial constraints, squares show a more direct association with income levels. Their lower availability in low-income areas highlights an unequal allocation of public spaces dedicated to everyday social interaction, leisure, and sociability.

In this regard, the study suggests that different types of public spaces have distinct capacities to reveal social and spatial inequalities. Streets, due to their widespread presence, tend to hide disparities; parks, since they depend on specific conditions, do not directly reflect socioeconomic dynamics; and squares, due to their embeddedness in the scale of everyday urban life, prove to be particularly sensitive to public investment decisions and the historical processes involved in urban space production.

It is important to note that the analysis is limited to the quantitative dimension of public space allocation and does not incorporate qualitative aspects such as conditions of use, maintenance, safety, and social appropriation. To address these aspects, further investigations must be conducted, primarily through fieldwork and qualitative analytical approaches, to provide a basis for future work. Moreover, the study does not consider influence areas or the effective coverage of these spaces, which represents a significant limitation in understanding true access. Nevertheless, the use of Human Development Units proved appropriate for the proposed analysis, enabling greater coherence between spatial and socioeconomic data.

This study emphasizes the importance of linking spatial indicators to social variables in urban analysis, demonstrating that public space should be understood as an unevenly distributed resource throughout the territory, despite its statistical simplicity. By highlighting the role of squares as a particularly sensitive indicator of socio-spatial inequality, the research opens new possibilities for improving analytical tools and developing public policies more oriented toward territorial equity.

Finally, it is argued that the construction of more equitable cities depends not only on increasing the quantity of public spaces but, above all, on their balanced distribution across the territory, to ensure fair conditions for coexistence, sociability, and access to urban life.

Declaration

During the preparation of this manuscript, the author used ChatGPT (free version) and Grammarly (paid version) to support language revision and English translation. The author subsequently reviewed, edited, and validated all content in accordance with academic standards and takes full responsibility for the integrity and accuracy of the work.

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Curitiba, Rua XV de Novembro. Area with high per capita income and high Public Space Coefficient.
Photo by Felipe Schiarolli.