

Commuting time as a barrier to urban accessibility in the São Paulo Metropolitan Region (SPMR), Brazil

Tempo de deslocamento como barreira à acessibilidade urbana na Região Metropolitana de São Paulo (RMSP), Brasil

Tiempo de desplazamiento como barrera a la accesibilidad urbana en la Región Metropolitana de São Paulo (RMSP), Brasil

Le temps d'itinéraire comme barrière à l'accessibilité urbaine dans la Région Métropolitaine de São Paulo (RMSP), Brésil

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ABSTRACT

This paper aims to analyze the role of commuting time in public transport for urban accessibility to employment rates in the São Paulo Metropolitan Region (SPMR), over the last three decades. The methodology used combines quantitative and qualitative approaches. The quantitative approach was based on the use of microdata from the São Paulo Metro Origin and Destination (OD) survey, for the years 1997, 2007 and 2017, to analyze the cumulative accessibility to jobs, as a function of travel time by collective mode in the MRSP. For the qualitative approach, collaborative mapping workshops on accessibility were held with University in Unified Educational Centers (UniCEU)/Open University System of Brazil (UAB) participants from Perus, Capão Redondo and Água Azul – Cidade Tiradentes centers. Commuting time was found to be a barrier to urban accessibility to jobs, especially for poor residents of the urban peripheries in the SPMR.

KEYWORDS: urban accessibility; commuting time; barriers.

RESUMO

Este artigo tem como objetivo analisar o papel do tempo de deslocamento no transporte coletivo para a acessibilidade urbana aos empregos na Região Metropolitana de São Paulo (RMSP), ao longo das últimas três décadas. A metodologia utilizada combina abordagens quantitativa e qualitativa. A abordagem

quantitativa baseou-se na utilização dos microdados da pesquisa Origem e Destino (OD) do Metrô de São Paulo, dos anos de 1997, 2007 e 2017, para analisar a acessibilidade cumulativa aos empregos, em função do tempo de deslocamento por modo coletivo na RMSP. Para a abordagem qualitativa, foram realizadas oficinas de mapeamento colaborativo sobre a acessibilidade com participantes da Universidade dos Centros Educacionais Unificados (UniCEU)/ Sistema Universidade Aberta do Brasil (UAB) dos polos Perus, Capão Redondo e Água Azul – Cidade Tiradentes. Constatou-se, então, que o tempo de deslocamento age como barreira à acessibilidade urbana aos empregos, especialmente, aos moradores pobres das periferias urbanas da RMSP.

PALAVRAS-CHAVE: acessibilidade urbana; tempo de deslocamento; barreiras.

RESUMEN

Este artículo pretende analizar el papel del tiempo de desplazamiento en el transporte público para la accesibilidad urbana a los empleos en la Región Metropolitana de São Paulo (RMSP), en las últimas tres décadas. La metodología utilizada combina enfoques cuantitativos y cualitativos. El enfoque cuantitativo se basó en el uso de microdatos de la encuesta Origen y Destino (OD) del Metro de São Paulo para los años 1997, 2007 y 2017 para analizar la accesibilidad acumulada a los puestos de trabajo, en función del tiempo de viaje por modo colectivo en la RMSP. Para el enfoque cualitativo, se realizaron talleres de mapeo colaborativo sobre accesibilidad con participantes de la Universidad dos Centros Educativos Unificados (UniCEU)/Sistema Universitario Abierto de Brasil (UAB) de los centros Perus, Capão Redondo y Água Azul – Cidade Tiradentes. Se ha constatado que el tiempo de desplazamiento es un obstáculo para la accesibilidad urbana a los puestos de trabajo, especialmente para los residentes pobres de las periferias urbanas de la RMSP.

PALABRAS CLAVE: accesibilidad urbana; tiempo de desplazamiento; barreras.

RÉSUMÉ

Cet article vise à analyser le rôle du temps passé dans le transport en commun comme condition d'accès aux emplois dans la région métropolitaine de São Paulo (RMSP), au cours des trois dernières décennies. La méthodologie utilisée combine des approches quantitatives et qualitatives. L'approche quantitative repose sur l'utilisation des micro-données de l'enquête Origine et Destination (OD) du métro de São Paulo pour les années 1997, 2007

et 2017 afin d'analyser l'accessibilité cumulée aux emplois, en fonction du temps d'itinéraire dans le transport en commun dans la région métropolitaine de São Paulo. L'approche qualitative s'est traduite par l'organisation des ateliers collaboratifs de cartographie sur l'accessibilité avec des participants de l'Université des Centres Éducatifs Unifiés (UniCEU)/Système Universitaire Ouvert du Brésil (UAB) des centres Perus, Capão Redondo et Água Azul - Cidade Tiradentes. Les résultats ont constaté que le temps d'itinéraire est un obstacle à l'accessibilité urbaine aux emplois, en particulier pour les résidents pauvres des périphéries urbaines de la RMSP.

MOTS-CLÉS : accessibilité urbaine ; temps d'itinéraire ; barrières.

INTRODUCTION

Urban accessibility is a socially constructed concept aimed at ensuring people's access to opportunities in major cities worldwide. In Brazil, particularly in the metropolis of São Paulo, accessibility has historically been unevenly distributed across different social classes and groups.

In the metropolis of São Paulo, accessibility is shaped by socially produced spatial dynamics, often favoring the interests of the upper and middle classes in central areas, leading to the displacement and concentration of opportunities for their benefit. Meanwhile, the poorest residents of the urban peripheries are often marginalized from opportunities and compelled to spend significant time commuting across the city in search of employment.

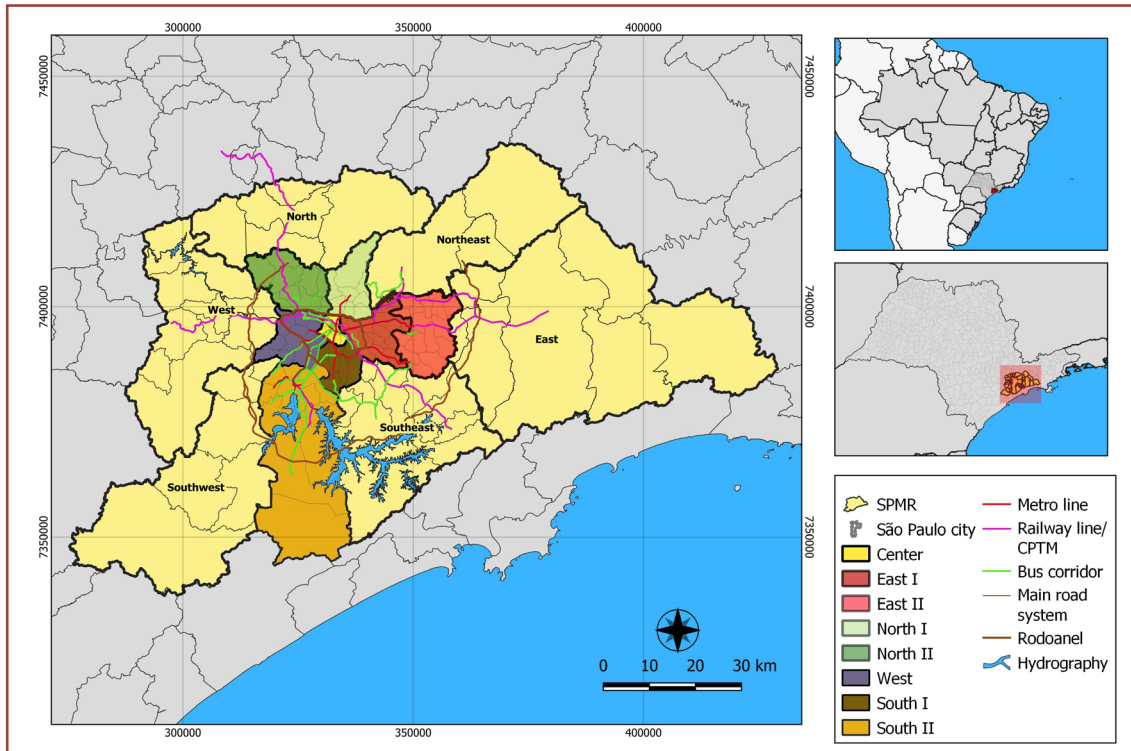
The socio-spatial inequality in urban accessibility within the metropolis of São Paulo has historical roots in elitist practices. These practices involve controlling time by manipulating the production of urban spaces (VILLAÇA, 1998), and there is a contentious competition among elites over areas that are better endowed with services and accessibility (SANTOS, 1990). Such disputes arise within an intrinsic interplay of social and territorial factors, which give rise to socio-spatial inequalities. As Santos (1987) asserts, an individual's worth is contingent upon their geographical location, which constantly fluctuates, for better or worse, owing to variations in accessibility factors such as time, frequency, and cost.

This article seeks to comprehend the significance of commuting time via public transportation in facilitating urban job accessibility, taking into account the dynamics of the past three decades in the São Paulo Metropolitan Region (SPMR). To achieve this goal, we aim to examine the extent of socio-spatial inequalities in access to employment opportunities, which may be linked to territorial stigmatization and social exclusion experienced by the impoverished population residing in urban peripheries.

The territorial scope of this analysis encompasses the SPMR, which comprises 39 municipalities, including São Paulo, the capital city of the state (Figure 1). The SPMR has a population of 20.8 million inhabitants and a population density of 26 inhabitants per hectare. With a total of 42 million daily trips, collective modes of transportation such as buses, subways, and trains account for 15.2 million trips, individual modes including cars and motorcycles represent 12.9 million trips, and active modes such as walking and cycling amount to 13.7 million trips. During these trips, individuals spend an average of 34 minutes on commuting, with segmented averages of 60 minutes for

collective modes, 26 minutes for individual modes, and 13 minutes for active modes (METRÔ, 2017). These trips are facilitated by 129.2 km of bus corridors, 101.1 km of subway network, and 271 km of train network, highlighting the daily mobility challenges faced by residents of São Paulo.

Figure 1 – Metropolitan Region of São Paulo (SPMR)



Source: IBGE, CEM, GEOSAMPA. Elaboration: Author.

The methodology used in this article focused on understanding urban accessibility by utilizing a specialized bibliography. Thus, for a critical examination of the issues in the SPMR, informed by these theoretical-methodological propositions, we employed a combination of quantitative and qualitative approaches. For the quantitative analysis, microdata from the Origin-Destination research conducted by São Paulo Metro for the years 1997, 2007, and 2017 were utilized. These data, organized by Origin-Destination zones – the smallest units in terms of area – were used to highlight urban job accessibility based on commuting time by public transport in the SPMR (METRÔ, 1997, 2007, 2017).

In possession of this data, the analysis was based on the concept of cumulative accessibility (GEURS, 2018; GEURS; VAN WEE, 2004). This methodology is widely employed in research on job accessibility (BITTENCOURT; GIANNOTTI, 2021; CARNEIRO et al., 2019; PEREIRA et al., 2019; SLOVIC et al., 2019), often utilizing data in the General Transit Feed Specification (GTFS) format, provided by

various Brazilian cities. However, for this article, given the territorial scope of the SPMR, we opted to base our study on data from OD research (HADDAD et al., 2015; BONISH, 2017). This approach holds the potential for replication and analysis across various municipalities on the metropolitan scale. Thus, cumulative accessibility indicators were obtained by compiling an Origin-Destination research matrix related to commuting time by public transportation to work.

This methodological proposal enabled a detailed analysis of the zonal divisions within the SPMR, specifically in São Paulo: Centro, Leste I, Leste II, Norte I, Norte II, Oeste, Sul I, and Sul II (SMDU/DEINFO, 2013). The focus was on highlighting inequalities related to the accessibility challenges faced by peripheral populations in their collective commutes to work.

The qualitative approach complemented the methodology through digital collaborative mapping workshops. These workshops aimed to reflect on the perceptions and urban experiences of peripheral residents concerning their commuting times and urban accessibility conditions. These workshops were conducted with undergraduate students from courses at the Virtual University in the Unified Educational Centers through the Open University System of Brazil (UAB). They took place at the Perus, Capão Redondo, and Água Azul – Cidade Tiradentes – centers, respectively, between May 18 and 20, May 25 and 28, and June 8 and 10, 2021.

The challenges of urban accessibility in the outskirts of São Paulo's metropolis stem from a historical process driven by the strategies of economic elites. This has resulted in the concentration of opportunities and public services, territorial stigmatization, and social exclusion. This process revolves around commuting time as an invisible barrier to urban job accessibility, hampering the social integration of the peripheral population in São Paulo city and the surrounding metropolitan peripheries of other SPMR cities.

TRAVEL TIME AS A BARRIER TO URBAN ACCESSIBILITY

Accessibility plays a crucial role in facilitating the acquisition of opportunities by different social classes and groups within specific territories. This is because accessibility encompasses not only the presence of transport infrastructure but also the effective possibility of utilizing it (LÉVY; LUSSAULT, 2003), extending beyond physical proximity to destinations to embody the ease of reaching destinations (VASCONCELLOS, 2001).

Accessibility is also intertwined with considerations of time, costs, the spatial distribution of amenities, and the population's capacity to access them

(GUIMARÃES et al., 2019). Thus, accessibility entails the relative ease of overcoming physical distances in space to engage in various activities, considering individual features of citizens (MIRALLES-GUASCH; CEBOLLADA, 2003).

In other words, accessibility is not uniform across a community, as it varies for different citizens within a given location (MIRALLES-GUASCH, 2002). It encompasses the satisfaction of needs and desires for movement, influenced by the availability and distribution of urban infrastructure and services in a particular area, along with transportation conditions. Moreover, it is shaped also by economic, regulatory, cultural, gender, and ethnic considerations (GUTIÉRREZ, 2009).

In this context, the absence of accessibility can be viewed through the lens of socio-spatial inequality, intricately tied to the capitalist framework (JIRÓN, LANGE; BERTRAND, 2010). Slovic et al. (2019), examining megacities such as São Paulo, observed that urban disparities and the segregation of impoverished groups are marked by unequal accessibility in peripheral areas. Recent studies in Brazil underscore disparities in access to services and opportunities for the black and peripheral populations (BITTENCOURT; GIANNOTTI, 2021; HADDAD; BARUFI, 2017; PEREIRA et al., 2019).

Classic studies conducted in Brazil demonstrate that inequality in urban accessibility and spatial segregation is a long-standing pattern, considering the migration of large populations into cities (MARICATO, 2003). In this context, the São Paulo metropolis, distinguished by its rapid peripheral expansion, emerges as the outcome of a multifaceted interplay of political, economic, and spatial factors and decisions. It is shaped by the competition among corporations and elites for areas deemed more accessible to public goods and services (SANTOS, 1990). As per Villaça (1998), the elites and middle classes segregate themselves by vying for central locations and exerting control over travel time, enjoying privileges in mobility, particularly through automobile usage (VASCONCELLOS, 1997). The poorest population, conversely, is marginalized in the urban peripheries, far from the city center and lacking access to employment opportunities, infrastructure, and services, thus exacerbating urban disenfranchisement (KOWARICK, 1979). They are relegated to rely on precarious public transportation, which is both time-consuming and financially burdensome for families (SANTOS, 1990).

According to Santos (1990), poverty, low wages, and structural unemployment contribute to the relative immobility of urban residents, leading to the fragmentation of urban space and, consequently, a form of social

exile for the poorest in the peripheries. However, Santos (1994, 2002) also highlights that a segment of those commuting for work are “slow individuals”, subjected to prolonged travel times and the constraints of utilizing unreliable public transportation (SILVA, 2016).

These challenges ultimately limit access to opportunities and public services, particularly for certain social classes and groups, resulting in territorial stigmatization (WACQUANT, 2007). Consequently, these marginalized groups do not identify with the areas where such services are provided, as they do not feel welcomed. Bourdieu (2008) discusses the impacts of spatial dynamics, where power manifests its most subtle form of violence against peripheries and ghettos. These territorial stigmatization and spatial effects are historically evident in the São Paulo metropolis, as illustrated by the case of middle and upper-class residents in the Higienópolis neighborhood. They opposed the construction of a subway station in their area, citing a reluctance to the increasing of diverse individuals circulating in the neighborhood (SILVA, 2016).

In this regard, the challenges of urban accessibility in the São Paulo metropolis perpetuate socio-spatial inequalities, stigmatization, and social exclusion. This aligns with Santos (1987), who has previously illustrated that one’s level of citizenship is heavily contingent upon their location within the territory and the accessibility of social goods available to them. According to Harvey (1980), achieving social justice in the city involves equitable spatial distribution to ensure fair mobility (SHELLER, 2018) and accessibility as a fundamental right to connectivity (GUTIÉRREZ, 2010).

INEQUALITIES IN COMMUTING TIME IN URBAN PERIPHERIES

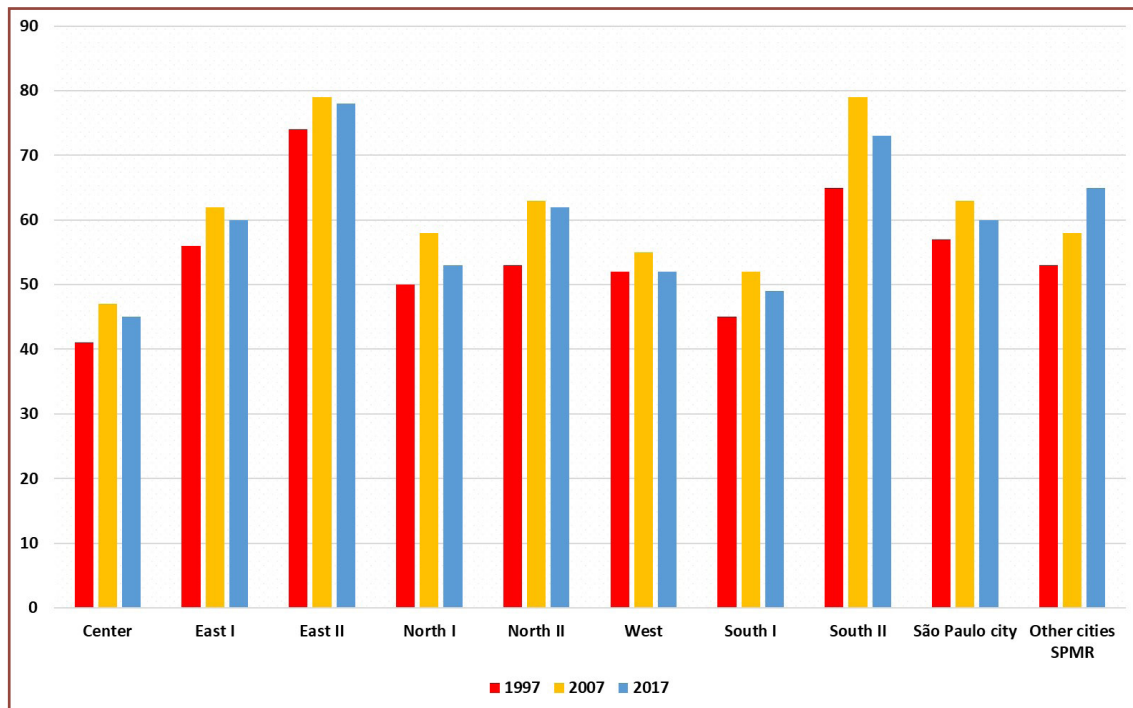
Considering commuting time as a social construct that unveils socio-spatial inequalities in the São Paulo metropolis, the following data serve to substantiate this claim.

When examining commuting times by mode of transport to work in the SPMR, there was an uptick in average commuting durations from 1997 to 2007, succeeded by a decline in 2017 specifically within the city of São Paulo. However, even with the overall decrease from 2007 to 2017, more substantial increases have been recorded in specific areas in recent decades.

In East Zone II, there was an increase of 5.4% in the average travel time, while in South Zone II and North Zone II, the increases were 12.3% and 17%, respectively. In addition, during the last period, East Zone II had the longest average commuting time in the SPMR, which was 30% higher than the city of

São Paulo's average. It is also worth mentioning that in 2017, individuals in East Zone II spent 73% and 50% of their time commuting, respectively, which is higher than the average for Central and West Zones. The other SPMR cities stand out as the only trend of continuous expansion of the average commuting time over the analyzed period (see Figure 2).

Figure 2 - Average commuting time by collective mode to work



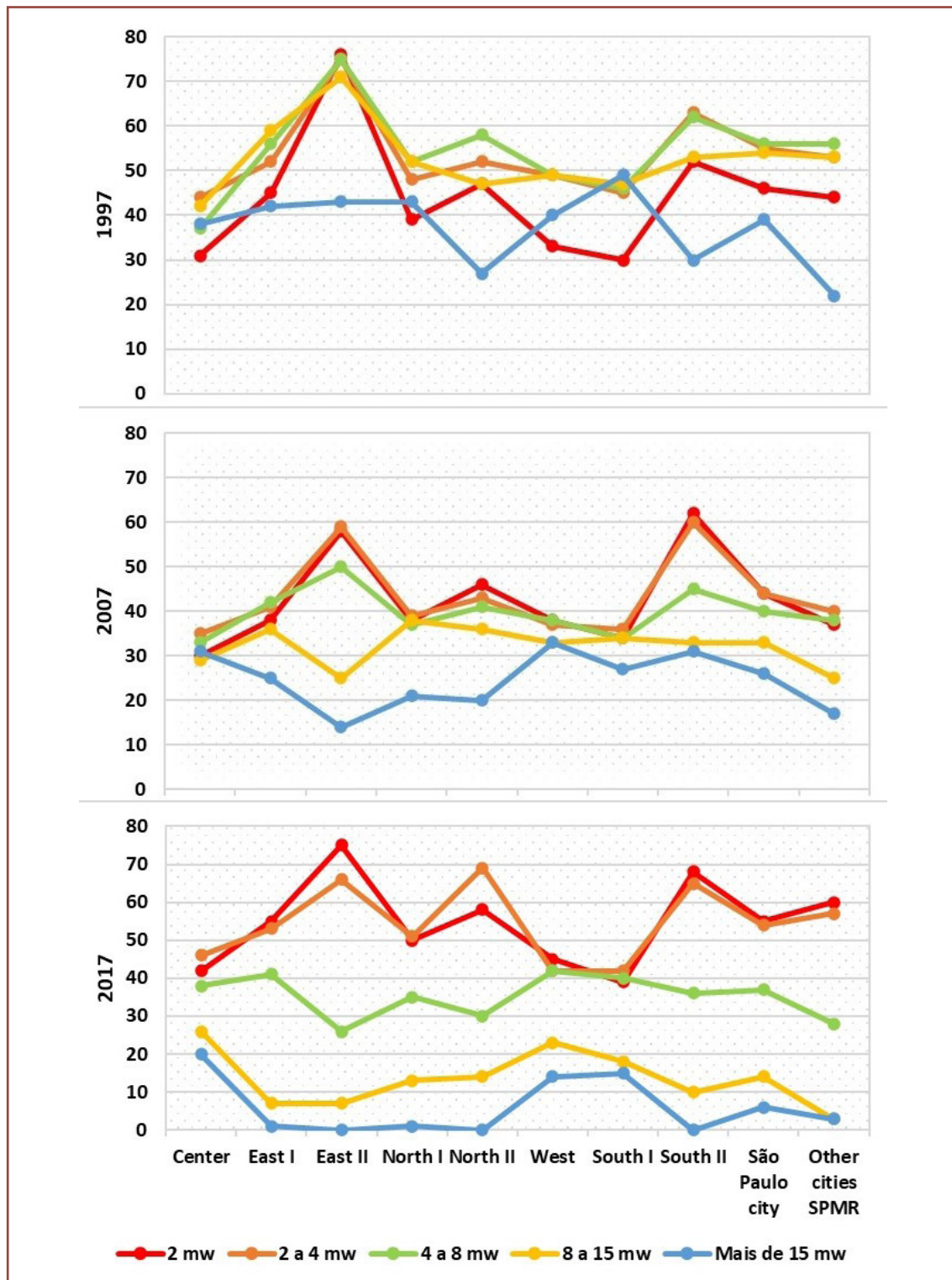
Source: Metrô, 1997, 2007, 2017. Elaboration: Author.

Indeed, the data indicate a general reduction in commuting time in recent decades within the city of São Paulo. However, the most modest declines in commuting time were observed in the peripheral zones of the city. It is noteworthy that in the other cities of the SPMR, there has been a tendency for commuting time to increase. This trend may indicate the proliferation of the segregation process and mobility challenges in the metropolitan peripheries of São Paulo, as anticipated by authors such as Santos (1990) and Villaça (1998).

Regarding commuting time in collective modes to work, segmented by average individual income ranges (Figure 3), several trends have been observed in recent decades in both the city of São Paulo and other cities within the SPMR. In the city of São Paulo, commuting time decreased for all income brackets, except for individuals earning up to 2 minimum wages, who experienced a 19% increase. In the other cities of the SPMR, a similar pattern emerged, with commuting time increasing only in the two lowest income

brackets. It was 36% higher for those earning up to 2 minimum wages and 7% higher in the range of 2 to 4 minimum wages.

Figure 3 - Commuting time by collective transport to employment, segregated by per capita income levels (measured in minimum wages)



Source: Metrô, 1997, 2007, 2017. Elaboration: Author.

When analyzing the various zones of the city of São Paulo, it is observed that the highest percentage increase in commuting time occurred in the income bracket of up to two minimum wages in East Zone II. Although commuting time in the lowest income bracket decreased by 1.3% between 1997 and 2017, it increased by 29% from 2007 to 2017. Currently, it is 78% longer compared to commuting time for people in the same income bracket in the Central Zone.

It is observed that the poorest population in the Central and Western Zones, where there is a relatively higher degree of homogeneity among the middle and upper classes, benefits from better accessibility conditions compared to the poorest population in the periphery. That's because, according to the data, lower-income individuals in peripheral areas spent 43% more time than people in the same income bracket in downtown São Paulo. This inequality is even wider when comparing the lower-income people in the peripheral zones to the higher-income people in the central zones. The former spend, on average, 128% more time than the latter.

Therefore, the average individual income and territorial determinations in the MRSP reveal certain challenges that extend beyond distance, also encompassing disparities in commuting time in the urban outskirts of the São Paulo metropolis. In this sense, living in the peripheries is a way of doubly condemning the poorest, resulting from the distortions of the economic and territorial model (SANTOS, 1987).

TRAVEL TIMES AS A BARRIER TO URBAN ACCESSIBILITY TO JOBS

Inequalities in commuting time result from social structures that impede access for the most impoverished and peripheral populations in the metropolis of São Paulo. This can be verified from the cumulative job accessibility data within a 60-minute radius in the public transportation system in the SPMR, given that this represents the average commuting time in the public transportation system in the SPMR (METRÔ, 2017; SLOVIC et al., 2019).

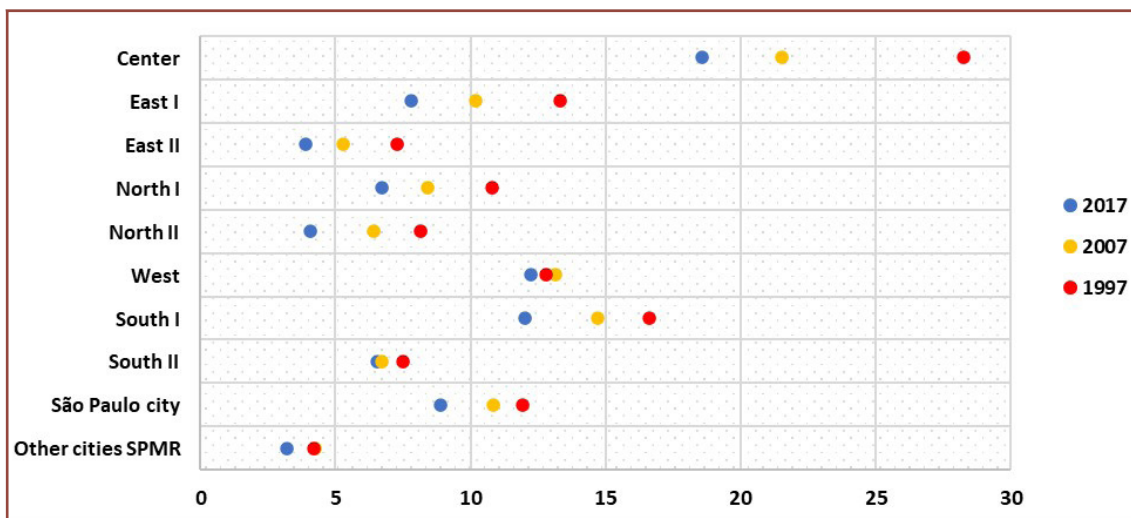
Throughout the analyzed period, it appears that the highest percentages of job accessibility occurred in the central zones of the city of São Paulo, such as the Center, South I, and West zones, except in 1997 when East Zone I occupied the third position, later being surpassed by the West. On average, during this period, the Central, South I, and West zones experienced a 22% decrease but still accounted for 17% of the accessible jobs in the city.

On the other hand, the remaining cities of the SPMR exhibited the lowest job accessibility percentages during the analyzed period. These cities

had consistently low rates between 1997 and 2007, which further declined in 2017. In the city of São Paulo, the poorest accessibility percentages during the period were observed in the East II, South, and North II zones. However, since 2007, the North Zone II has emerged as the second lowest percentage, trailing only the East Zone II. These three zones collectively represented an average of 6% of accessible jobs in the city of São Paulo, experiencing a decline of 34% over the analyzed period.

Thus, the peripheral zones, besides exhibiting a lower percentage of job accessibility, also witnessed a proportionally more significant decline compared to the central zones. The central zones (Central, South I, and West) boasted, on average, 2.3 times more accessible jobs than the peripheral zones (East II, South II, and North II). However, it's important to note that these peripheral zones are home to 52% of the population of the city of São Paulo, while the central ones comprise only 23% (see Figure 4).

Figure 4 - Accessibility within a 60-minute commuting time using collective transportation to work in different zones of the City of São Paulo and SPMR



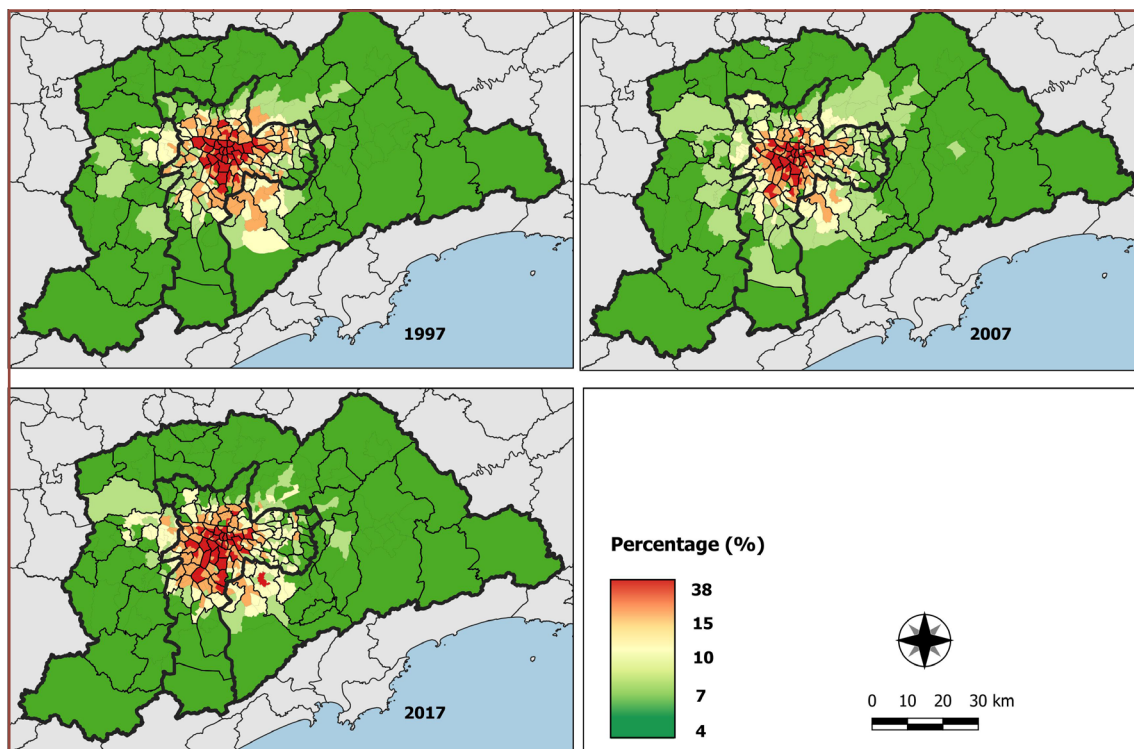
Source: Metrô, 1997, 2007, 2017. Elaboration: Author.

This becomes evident through spatial analysis of cumulative job accessibility within a 60-minute commute by public transport in the SPMR. The analysis reveals a distinct concentration of accessible jobs in the central areas of the metropolis, gradually declining towards the urban peripheries, both within the metropolis itself and across the SPMR (refer to Figure 5).

In 1997, within the Central Zone, the districts of Consolação (36%) and Sé (32%) were identified as the most accessible. Meanwhile, in the South Zone I, Vila Mariana (21.4%) and Saúde (20.8%) stood out for their accessibility. In

East Zone I, Tatuapé (23%) and Brás (20%) were the most accessible. In the East Zone II, the districts of São Rafael and Iguatemi (both with 3.5%) and Cidade Tiradentes (4%) registered the lowest percentages of accessibility. In Zona Sul II, the districts of Parelheiros (2%) and Marsilac (3%) had the lowest percentages. In the North Zone II, Turkeys (4%) and Anhanguera (4.5%) were the districts with the lowest accessibility. In addition, the other cities of the SPMR, such as Mairiporã (0.2%), Francisco Morato (0.6%), both in the Northern sub-region, and Rio Grande da Serra (0.5%), the Southeastern sub-region, also showed low percentages of job accessibility.

Figure 5 - Accessibility by commuting time within 60 minutes in collective mode to work



Source: Metrô, 1997, 2007, 2017. Elaboration: Author.

In 2007, jobs were more readily available in the central zones, with the República (29.3%) and Sé (29%) districts leading in the Central Zone. In the South Zone I, the highlights were Vila Mariana (19.3%) and Health (19.2%). This year, the West Zone was more accessible, with higher percentages in the districts of Jardim Paulista (19.7%) and Pinheiros (18.8%). However, in the East Zone II, the lowest percentages were in Iguatemi and Lajeado (both 3%) and Guaianases (3.5%). In the North Zone II, the districts of Brasilândia (4%) and Cachoeirinha (4.3%) had the lowest percentages. In Zona Sul II,

Marsilac (2%) and Parelheiros (3%) had the lowest percentages of accessibility. The other cities of the SPMR continued to be characterized by low percentages of job accessibility, especially Mairiporã (0.2%) in the Northern sub-region, followed by Embu-Guaçu in the Southwestern sub-region, Francisco Morato, and Franco da Rocha (both with 3%, from the same Northern sub-region).

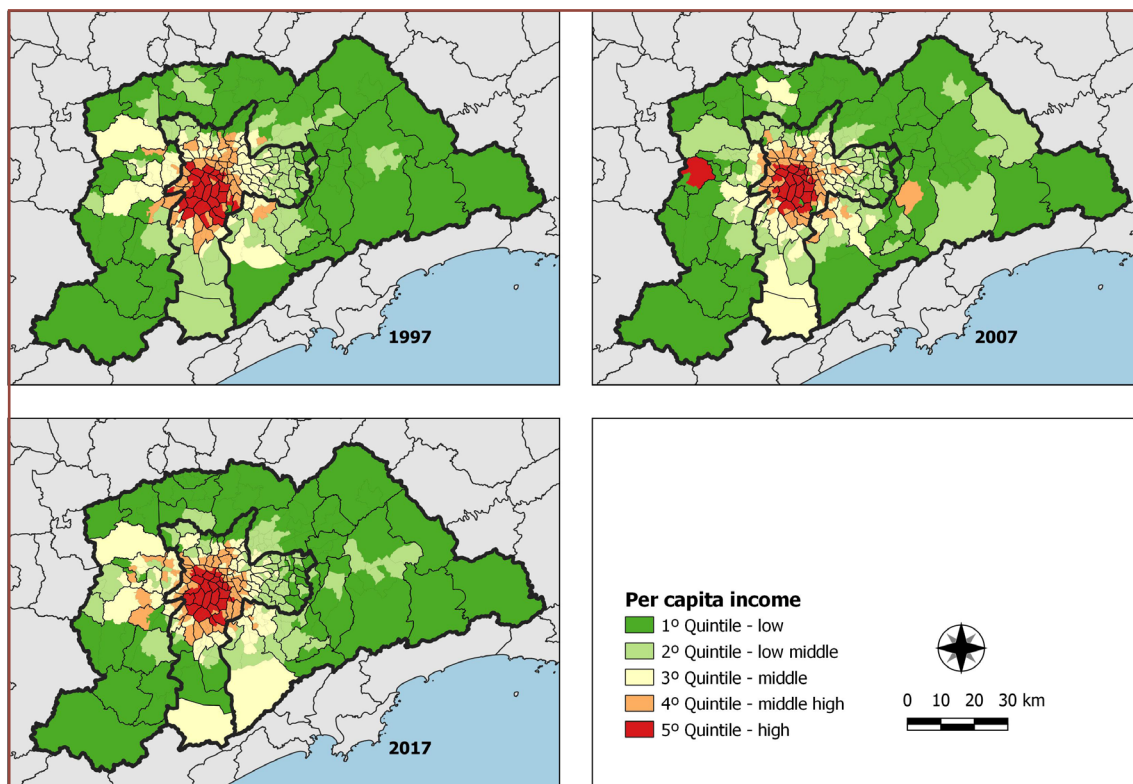
In 2017, the districts of Sé (27%) and República (22.7%) remained the most accessible in the Central Zone. In the West Zone, Pinheiros (21.5%) and Jardim Paulista (19.7%) exhibited the highest percentages, while in the South Zone I, the districts of Vila Mariana (17.9%) and Saúde (14.8%) persisted. The East Zone II had the lowest percentages of accessibility, with the districts of Cidade Tiradentes (2%), Guaianases, and Jardim Helena (both 2.5%) having the lowest accessibility rates. In Zona Norte II, Anhanguera and Perus (both 2%) had the lowest percentages of accessibility, while in Zona Sul II, Marsilac (1%) and Parelheiros (1.5%) had the lowest percentages. The other cities of the SPMR remained with low percentages of accessibility. Mairiporã (0.2%) in the Northern sub-region, Francisco Morato and Franco da Rocha (0.8%) in the Northern sub-region, and Santa Isabel (0.5%) in the Eastern sub-region all had low accessibility rates.

This underscores how cumulative job accessibility unveils a stark socio-spatial inequality, favoring residents of central areas, which concentrate a higher number of jobs compared to the urban peripheries of São Paulo (BOISJOLY; MORENO-MONROY; EL-GENEIDY, 2017). The unequal accessibility is supported by studies showing its lowest percentages in the peripheries of the East, South, and North Zones of São Paulo city (SLOVIC et al., 2019).

This finding is evident when reading the inequalities of accessibility to jobs in relation to income (Figure 6). In 1997, 2.7 million of the upper-income people accessed 15.2% of jobs within the 60-minute range collectively. Among these individuals, 10% were concentrated in South Zone I, accessing 19% of the available jobs. Meanwhile, the 2.7 million of lower-income people accessed 2.8% of available jobs, with 10% of them located in South Zone II.

In 2007, 1.5 million of the upper-income people accessed 16.6% of jobs within 60 minutes collectively. These people were primarily concentrated in South Zone I, constituting 30.5% of the population in this income range. People in the lowest income bracket, on the other hand, totaled 4 million individuals who accessed only 1.9% of jobs, with 18% of them located in East Zone II.

Figure 6 – Accessibility by commuting time within 60-minutes range in collective mode to work, by per capita income



Source: Metrô, 1997, 2007, 2017. Elaboration: Author.

In 2017, 1.9 million upper-income individuals collectively accessed an average of 14.6% of jobs within 60 minutes. These individuals were primarily concentrated in the West Zone, with 34.8% of the population in this income range. Out of the 4.3 million lower-income individuals, only 1.9% had access to jobs, and 24.3% of these jobs were located in East Zone II.

It appears that individuals from higher income brackets residing in more central areas – where there is greater availability of public transport and job opportunities – enjoy greater accessibility. Conversely, those from lower income brackets, situated in more peripheral areas, experience reduced accessibility to job opportunities. In this regard, commuting time emerges as an invisible barrier to urban job accessibility, especially for the poorest population residing in the urban peripheries of the SPMR.

PERCEPTIONS OF TRAVEL TIME EXPERIENCES AS A BARRIER TO URBAN ACCESSIBILITY

In the metropolis of São Paulo, the management of commuting time plays a central role in the competition for the city among various classes and social

groups. This control results in the establishment of an invisible barrier, which perpetuates spatial segregation and socio-spatial inequalities, making accessibility challenging for residents of urban peripheries.

These challenges are evident in the narratives of residents living on São Paulo's outskirts, specifically in East Zone II, South Zone II, and North Zone II. Identified as areas with longer travel times and less accessibility to the center of the metropolis. Participant W, a black male resident of Cidade Tiradentes, highlights the challenges faced by individuals from the periphery of the East Zone in comparison to those from the West Zone.

The interests of the people, including those waiting at the bus stop, differ significantly from those of the people here. These individuals also have significantly shorter travel distances compared to those residing in the East Zone. For example, when I went to work on Avenida Faria Lima, people took the same bus as me, but I was two hours away from my destination. These people would reach their destination 10 minutes later. When I was alone on the bus, I noticed that the route was shorter, and the stops along the way were different [...] Our destinations do not typically include theaters; to reach one, we would have to travel for two or three hours.

The inequality of opportunities, public services, and urban facilities are factors that hinder accessibility in the metropolis of São Paulo. Participant W explains this relationship in the continuation of his report:

Unlike the residents of the aforesaid places or those who live ten minutes away from the theater, they have the option to travel by bicycle. I arrived at work at the Santander Bank tower in Vila Olímpia, and I was the only employee who got a ride. To go, he took four different routes. But practically all the employees there, except for me, went by bicycle because they lived nearby, ten to fifteen minutes at the most. So, there's a significant contrast there.

In the same line of reasoning, Participant H, a black male resident of Cidade Tiradentes, corroborates this issue.

Imagine arriving here on a Thursday night, after enduring two hours of traffic, where do I go? [...] We are unable to actively participate in leisure and cultural activities at the same level as others. I had a colleague who left work at 4:00 pm and was already home by 4:30 pm. She lived in the center. Then she said that at 6:00 p.m., she was going to have dinner with her friends [...]. Dude, living in the East Zone in the middle of the week during rush hour, there's no time for anything else. You can take out your lunch box, if that.

The socio-spatial inequality in urban accessibility within the São Paulo metropolis has historical origins in elitist practices. These practices entail controlling time through the manipulation of urban space production (VILLAÇA, 1998), with elites engaging in contentious competition over areas possessing superior services and accessibility (SANTOS, 1990). In this

context, the notion that an individual's worth is determined by their place of residence becomes apparent (SANTOS, 1987). Participant Q, a female resident of Cidade Tiradentes, who identifies as white, reported that in the past, public transport had fewer options and higher capacity to travel to the Avenida Paulista area.

[...] on the return journey, I could reach there more easily within an hour and twenty minutes to an hour and a half. Nowadays, I notice that we face even more difficulty due to the increased number of people. [...] As a result, the return journey home takes around two and a half hours, making it a total of four and a half hours spent commuting.

In the framework of mobility conceived as a resource, as outlined by Cresswell (2009), wherein the swiftness of some corresponds to the sluggishness of others, it exposes a scenario at odds with equitable mobility (SHELLER, 2018) and accessibility as a fundamental right to connectivity (GUTIÉRREZ, 2010). Participant C1, a female resident of Capão Redondo who identifies as black, exemplifies the challenges stemming from this logic of unequal mobility and accessibility in the city through the reduction of bus routes.

Consider the number of workers and the challenge of navigating multiple bus routes to reach your workplace. They place the buses you rely on along the Régis Bittencourt Highway and cut down on the distance covered, precisely because you have no choice, and the buses are consistently crowded [...]. Moreover, they eliminate the bus collector, leaving only the driver, which further contributes to delays in transportation.

This mobility model, regarded as a resource in the São Paulo metropolis, gained momentum with the introduction of road transport through the Avenues Plan in the 1930s, and was solidified in the 1960s with the widespread adoption of automobiles among the middle class, a trend that surged further in the 1990s. It's a model rooted in individual solutions that have increasingly favored automobiles and, more recently, motorcycles over public transport (VASCONCELLOS, 2013; SILVA, 2016). Participant C2, a black male resident of Perus, illustrates this situation.

I worked in two private schools and, ironically, despite my tight schedule, I had to travel from Tucuruvi in the North Zone to Pari in just twenty minutes. That's when I found myself compelled to purchase a motorcycle to facilitate this commute [...]. The motorcycle significantly enhances agility, but there's always the risk of traffic; you're responsible not only for yourself but also for everyone else on the road [...] Today, thank God, I work less than five minutes away from my home. And the other one is not even fifteen minutes away, so it brought about a significant improvement in my quality of life.

In the context of neoliberalism, the notion was propagated that relying on the market alone could resolve mobility issues, fueled by the expansion of bank credits and financing. However, this has led to a rise in the precariousness of public transport, congestion, and the risk of traffic accidents, particularly for motorcycle riders (SILVA, 2016). Participant J, a black female resident of Cidade Tiradentes, criticizes the ideology of individual transportation and advocates for collective solutions to address the issue.

Therefore, our challenge lies in advocating and exerting pressure to enhance transportation infrastructure in our area, as it constitutes the primary workforce hub. Whether we like it or not, the periphery is where most of the society employed by companies is concentrated.

Subsequently, Participant J delves further into her line of reasoning, problematizing more broadly: “We must strive to improve and develop, devising means for the local population to find employment opportunities here, thus reducing the need for extensive commuting distances.” At this point, Participant C steps forward and questions the role of the State, particularly concerning the quality of life of peripheral workers:

I think that the big problem even of our rulers is not having this look at the periphery. Indeed, they view the periphery only as a source of labor. So, as you can see, they desire inexpensive labor, yet they do not prioritize ensuring a high quality of life for these individuals.

The reality is that restricted accessibility is a deliberate strategy employed to segregate the poorest population residing in urban peripheries, compounded by territorial stigmas (WACQUANT, 2007) and place effects (BOURDIEU, 2008), which residents of these peripheries confront daily in the São Paulo metropolis. Participant B, a black female resident of Capão Redondo, serves as a poignant example of this circumstance:

In the neighborhood of Interlagos, which is predominantly inhabited by the middle and upper classes, there exists a sort of bubble, so to speak, situated roughly in front of the racetrack [...]. It's not just anyone who will traverse through that area. There are closed streets, gated entrances, and barriers; those without barriers are surveilled, making them inaccessible to just anyone. Perhaps only those who reside there. [...] Consequently, there is no democratization of space; mobility, at least in certain enclaves in São Paulo, is severely restricted [...]. Access to certain neighborhoods is hindered because the residents perceive themselves as superior to any passerby.

Thus, as Santos (1990) elucidates, space becomes fragmented due to the immobility of the poorest residents of the peripheries, who are left to depart at a sluggish pace (SANTOS, 1994, 2002). They are stigmatized and subjected

to prejudice by the upper and middle classes, who monopolize accessible opportunities and perpetuate social exclusion, both tangibly and symbolically. Hence, the establishment of commuting time as an invisible barrier to urban accessibility constitutes a fundamental component of the strategies employed by the economic elites in the SPMR. In essence, the residents of the peripheries remain isolated or relegated to slow mobility within the urban peripheries, a manifestation stemming from the deliberate project of inaccessibility and spatial segregation orchestrated by the economic elites.

CONCLUDING REMARKS

Over the past decades, as gleaned from the analyzed data, it is apparent that commuting time has evolved into an imperceptible barrier to urban accessibility, particularly concerning employment opportunities for the most economically disadvantaged populations residing in the urban peripheries of the SPMR. During this period, there was a decline in the average commuting time via collective modes of transportation to workplaces within the city of São Paulo, albeit with an exception observed in other cities within the SPMR. It is worth noting that the reduction was comparatively less pronounced in the peripheral regions.

There is also a decrease in cumulative accessibility to jobs within the SPMR, with a proportionally more pronounced decline observed in the other cities of the SPMR and in the peripheral areas of East II, South II, and North II within the city of São Paulo. In these areas, socio-spatial inequalities are more conspicuous, as they not only exhibit a low percentage of accessible jobs but also accommodate just over half of the population of the city of São Paulo.

Individual average income emerged as a significant determinant in this dynamic, as individuals with lower incomes tend to endure longer commuting times and have diminished accessibility to job opportunities. It is also crucial to underscore the territorial dimension, as individuals residing in the peripheral zones, particularly the economically disadvantaged, contend with substantially longer travel times and diminished job accessibility compared to their counterparts in the central zones. This exacerbates, rather than mitigates, the conventional center-periphery dichotomy.

Therefore, the accessibility challenges in the metropolis of São Paulo represent one aspect of the political strategies employed by economic elites to maintain dominance over the poorest residents and those living in the peripheries. This social process unfolds through the control and consolidation

of opportunities, alongside stigmatization and social avoidance, leveraging commuting times as an imperceptible barrier within the SPMR. Consequently, this engenders disparities in mobility, exacerbating spatial segregation.

Hence, overcoming the concealed hurdle of commuting time in the São Paulo metropolis necessitates a reevaluation of the urban paradigm or the envisioning of an alternative model – one that is equitable and inclusive, fostering diverse employment prospects and land use. This model should prioritize low-emission public transport, interconnected within a network that integrates active modes of transportation, such as walking and cycling, accessible to all strata of society, particularly the marginalized denizens of the urban peripheries within the SPMR. ●

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