

Densification and verticalization in the central cities of the Metropolitan Region of Baixada Santista

Adensamento e verticalização nos municípios
centrais da Região Metropolitana da Baixada Santista

Lenimar Gonçalves Rios [I]
Mônica Antonia Viana [II]
Alexandre Lukas Morrone [III]

Abstract

The article discusses the verticalization and densification process of central cities in the Metropolitan Region of Baixada Santista, state of São Paulo, and its effects on the socio-spatial structure and on the environment in the period between 1980 and 2010. It also analyzes projections for the 2010-2020 period, based on data from official agencies and the real estate market. The results reveal that this process has changed the natural landscape and currently reinforces socio-spatial segregation, with dispersion of occupation to environmentally vulnerable areas, generating urban mobility problems.

Keywords: verticalization; densification; urban morphology; urban transformations; Metropolitan Region of Baixada Santista.

Resumo

Este artigo discute o processo de verticalização e adensamento dos municípios centrais da Região Metropolitana da Baixada Santista – RMBS do estado de São Paulo e seus reflexos na estruturação socioespacial e no meio ambiente no período entre 1980 e 2010. São também apresentadas e analisadas projeções para o período de 2010-2020, a partir de dados de órgãos oficiais e do mercado imobiliário. O resultado revela que esse processo alterou a paisagem natural e atualmente reforça a segregação socioespacial com dispersão da ocupação para áreas vulneráveis ambientalmente, gerando problemas de mobilidade urbana.

Palavras-chave: verticalização; adensamento; morfologia urbana; transformações urbanas; Região Metropolitana da Baixada Santista.



Introduction

The land use pattern in the central municipalities of Baixada Santista Metropolitan Region – RMBS¹ (Santos, São Vicente, Guarujá and Praia Grande) is morphologically characterized by a combined vertical and extensive occupation. The central municipalities form a conurbation, and in the past two decades this conurbation has grown mainly because of the verticalization of areas close to the seafront and to the main intra-urban and metropolitan transport routes.

Santos is the most vertical city in the region and in the Brazil,² with 61.1% of residences in apartments, followed by São Vicente (21.6%), Praia Grande (21.4%) and Guarujá (10.9%) (Sidra-IBGE, 2010). In these municipalities, the vertical occupation has singularities: it occurs along the seafront, and the housing units are predominantly used for tourism purposes (except for Santos and São Vicente), only occasionally being used as temporary residences,³ staying idle most of the year. Thus, a fluctuating population density is evidenced, and part of the existing residences in vertical residential developments, especially those close to the seafront (beaches), remain idle most of the time. However, for the stage of research presented in this study, only housing units occupied by permanent population will be investigated.

This research is developed within the research group Observatório Socioespacial da Baixada Santista (Socio-spatial Observatory of Baixada Santista) – Observa BS,⁴ which is linked to the Institute of Scientific and Technological Research – Ipec, from the Catholic University of Santos – UniSantos, in partnership with

the research group Process of Production of Constructed Space and the Landscape Laboratory in Brazil – Quapá from FAU-USP (São Paulo University School of Architecture and Urbanism).

The general purpose of the research, in this first stage, is to understand the main urban form structures in the central municipalities of RMBS (Santos, São Vicente, Guarujá and Praia Grande), based on the processes of urbanization and morphological transformation of the urban space, with focus on the verticalization forms and typologies and their relationship with population concentration.

As specific objectives, we seek to understand the process of housing production through verticalization, especially in the period 1980-2010, with some prospects for the period 2010-2020. Between 1980 and 2010, there were changes in the demographic profile of this region's municipalities, especially in Praia Grande, known for its predominantly touristic function, but which has been experiencing a population retaining process in recent decades. The relationship between verticalization and population density and real estate production is studied, and topics regarding the socio-spatial and environmental impacts of this process on the set of RMBS central municipalities are raised for reflection.

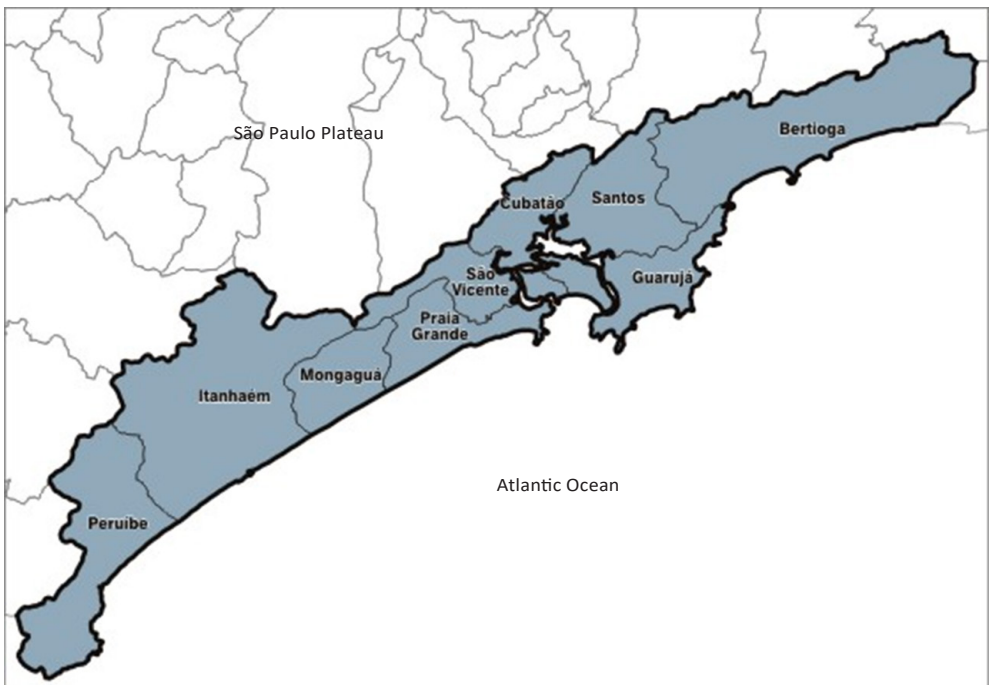
This work is divided into three parts. In the first section, we address the historical process of the urban space production and transformation starting in the 1950s, when the process of verticalization along the beachfront and changes in the seafront configuration of central municipalities began. In the second section, the evolution of the occupation

is analyzed, with focus on the spatial growth and its relationship with population increases in the period 1980-2010, when the metropolization process was intensified and consolidated, largely due to migratory flows and urban growth, which resulted in the institutionalization of the RMBS in 1996. In the third section, some prospects are presented regarding the demographic growth process and the real estate market production in the

period 2010-2020, to verify which are the ongoing changes in the occupation dynamics of the region.

In the Final Considerations, findings are presented in light of the proposed objectives, as well as recommendations and new questions are formulated for the continuation of the research in its next stages with the Observa BS of UniSantos and FAU-USP partners.

Figure 1 – Metropolitan Region of Baixada Santista - RMBS - São Paulo



Source: Agem – Metropolitan Agency of Baixada Santista (2002).

Production and transformation of the urban space

The central area of the Baixada Santista Metropolitan Region, comprising the municipalities of Santos, São Vicente, Guarujá, Praia Grande and Cubatão,⁵ is located on the coastline of São Paulo state, close to the Brazilian most dynamic economic hub. Such municipalities that form a conurbation and are polarized by Santos represent the most economically dynamic part of São Paulo state coastline, because it houses the Port of Santos and the Petrochemical Complex of Cubatão, in addition to the activities of seaside tourism.

For three centuries, Santos acted as a barrier of defense to the colonial territory, and through its port, as a modest warehouse for the incoming goods demanded by the residents of São Paulo plateau. Until the early 20th century, it maintained the limits of the area occupied during its first decades of existence.

The process giving rise to the first period of dynamism in the region took place in the late 19th century, when the port of Santos became the channel for coffee trade, the main Brazilian export produce at the time. The contemporary Santos was then formed, stimulated by the implementation of the São Paulo Railway in 1867, connecting Santos and the coffee-producing areas on the plateau. This initiative was articulated with the construction of the organized port (instead of precarious warehouses) and with urban infrastructure investments, which allowed the city to expand beyond the colonial limits (Viana, 2010). Santos and Guarujá were pioneers in the tourism activity, facilitated by the rail connection with São Paulo and

the countryside, becoming places of rest and leisure for the coffee producing elite.

A new period of economic dynamism in Brazil and in Baixada Santista region began after the Second World War with the economic diversification, through investments that strengthened the port, industrial and touristic functions. At that point, the industrial park of São Paulo state's capital began to expand to other municipalities in Greater São Paulo and into the countryside, following the old railway axes and the new road axes implemented in the late 1940s, intensifying the urbanization process (*ibid.*).

The implementation of the industrial hub of Cubatão derived from this process, particularly with the inauguration of the Anchieta highway (1947), which improved the flow between the coast and the plateau, also boosting the development of mass tourism on the region's beaches. The port of Santos increased in size with the construction of the Saboó wharf and with the replacement of old cranes by more modern equipment, which led to an increase of its cargo handling capacity (*ibid.*).

With the introduction of the urban-industrial model that boosted the urbanization of Brazilian cities, combining the growth of economic activities and the expansion of the urban fabric resulting from the intense migratory process, the political-administrative division of the region's original municipalities were fragmented (*ibid.*). Districts were emancipated becoming municipalities between the late 1940s and 1960s.⁶

This process of emancipation within Santos and São Vicente territories gave rise to the municipalities of Guarujá, Cubatão, Itanhaém, Praia Grande, Mongaguá and

Peruíbe. Santos urban fabric developed in the urban voids still existing in the island of São Vicente at that time. However, this urban development was not limited to Santos, overflowing to the municipalities of São Vicente and the newly created Guarujá, with the occupation of the Vicente de Carvalho district.

The role Santos began to play in the regional growth dynamics in the 1960s is highly relevant. The eastern part of the municipality (limited by the port, the hills, and the beaches) began to be urbanized in the early 20th century, with the Saturnino de Brito Sanitation Plan. Systems were implemented for water supply, sewerage (collection and treatment), as well as an urban drainage system that allowed the use of a vast area that was previously swampy for urban purposes. With the migratory wave of the mid-twentieth century, driven by the implementation of the industrial hub of Cubatão, by the expansion of port facilities and by civil construction, the empty land located in the urbanized portion was occupied by the residences of more qualified port and industrial workers. The low-income population settled in the non-urbanized portion, building their own houses themselves on land below the sea level, thus subject to flooding, and on landslide-prone areas of hills in Santos, a process that extended to neighboring São Vicente and to Vicente de Carvalho district, in Guarujá (Carriço, 2015). This process promoted the extensive occupation of environmentally vulnerable areas and resulted in the gradual suppression and degradation of parts of the Atlantic Rainforest biome.

Mass tourism, the result of middleclass expansion in the period of Brazilian industrialization, was responsible for the

creation of new municipalities. The seaside tourist⁷ activity first took place in Santos, São Vicente and Guarujá, and then, with the implementation of new accesses to the plateau and between the municipalities in the region, it expanded towards the southern and northern coast, originating six of the nine municipalities in the RMBS, including Praia Grande, today part of the conurbation of the region's central area (Rios, 2019).

To give a response to the great demand of mass tourism, the real estate market produced, on a large scale, housing units intended for second residences, with the maximum use of the beachfront strip, to accommodate season apartment buildings, initially verticalizing the beaches of Santos, São Vicente and Guarujá. The phenomenon occurred a little later in Praia Grande, which, from the 1960s onwards, quickly transitioned from a rural to a tertiary-based economy (Rios, 2019).

This phenomenon caused changes in urban legislation, under pressure from the real estate market, which resulted in a reduction of lot setbacks and an increased lot occupation. The high constructive coefficients used created, in the municipalities of the region, what Seabra (1979) called the "wall that surrounds the sea".

Referring to the municipality of Santos, Araújo Filho (1965, p. 40) notes that:

This line of skyscrapers [...] constitutes a new type of urban space occupation, now in the vertical sense [...] these apartment buildings represent not only the most recent type of occupation of Santos beaches, but also the most representative of one of the four functions of the city: the summer holidays.

Figure 2 – Beachfront of Santos and São Vicente, 1940

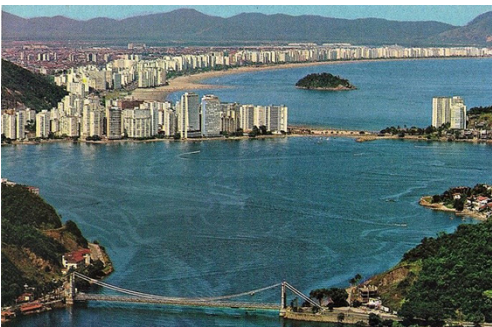


Figure 3 – Beachfront of Santos and São Vicente, 1950



Source: Novo Milênio (2021a and 2021b).

Figure 4 – Beachfront of São Vicente and Santos, 1970



Source: São Vicente na Memória (2021).

Figure 5 – Beachfront of Guarujá – 1950



Source: IBGE (2021).

Figure 6 – Beachfront of Guarujá – 1960



Source: Hotel Santa Maria Guarujá (2021).

Figure 7 – Guarujá 2000



source: Guarujaweb (2021).

Within three decades, the features of the beachfront underwent intense changes (Figures 2 to 7).

The verticalization process along the beachfront first produced units aimed at the floating population, and then served as residences for high-income residents (Seabra, 1979).

The tourist activity expression can be seen in the number of occasional use residences. In the municipalities of Santos and São Vicente, residences with permanent

residents are numerically higher than those for occasional use (second residence), while in Guarujá and Praia Grande, the presence of the latter is accentuated, with an impact on the installed structures, which remain idle most of the year (Table 1) due to the seasonality of seaside tourism.

Although the 2010 IBGE Demographic Census revealed a high percentage of occasional-use residences in Praia Grande, when compared to other municipalities, its permanent population has grown in recent

Table 1 – Residences of permanent use and occasional use per municipality

Municipalities	Permanent use – %	Occasional use – %
Santos	81,70	11,33
São Vicente	82,62	9,43
Guarujá	61,81	33,69
Praia Grande	41,73	52,44

Source: Demographic Census (IBGE, 2010). Prepared by Institute Polis in 2013.

Table 2 – Permanent population and geometric annual growth rate 1991-2020

Municipalities	Year				TGCA		
	1980	1991	2000	2010	1980-1991	1991-2000	2000-2010
Santos	416,681	417,100	417,983	419,400	0,11	0,02	0,04
São Vicente	193,002	268,618	303,551	332,445	3,05	1,37	0,94
Guarujá	151,127	210,207	264,812	290,752	3,05	2,60	0,93
Praia Grande	66,011	123,492	193,582	261,051	5,86	5,12	3,17

Source: Demographic Census (IBGE, 1980, 1991, 2000 and Sidra-IBGE, 2011). TGCA calculated by the authors in 2021.

decades due to the migration of residents from Santos (mainly) and São Vicente (Table 2). The same phenomenon experienced in the 1960s in relation to the neighbors of Santos is repeated, except that now the migration to Praia Grande is led by segments of the middleclass (Jakob, 2004), a movement driven mainly by young couples, in view of the high cost of properties in Santos. In 2010, the number of Praia Grande residents increased to levels close to those of São Vicente and Guarujá (Table 2).

Urban legislation played an important role in the construction of the verticalization model, since, until the 1970s, when the urbanization process was consolidated, municipalities adopted parameters of land use and occupation in the strips close to the beachfront, which provided these spaces with characteristics of environmental excellence (Carriço, 2002), of great interest to the real estate market. These concepts are still the basis for the legal provisions that guide the growth of central municipalities, resulting in greater appreciation and real estate speculation in areas close to the beachfront.

Spatial growth and demographic growth in the period 2000-2010

The effects of the regional urban fabric expansion, due to the RMBS economic diversification, appear in the figures of the demographic censuses since the 1980s, when

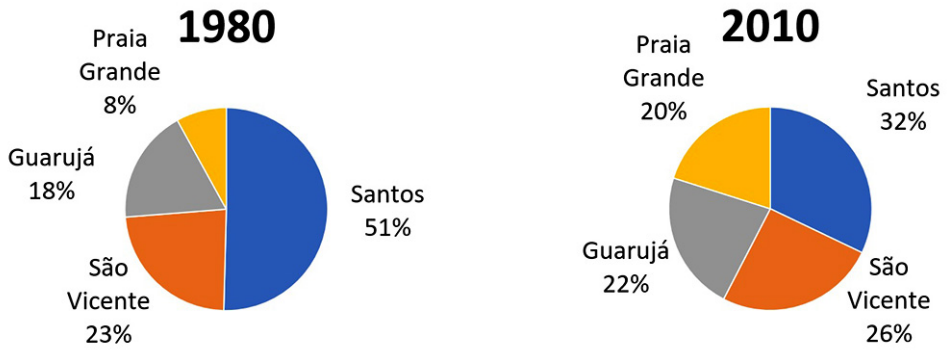
the pace of population growth in Santos is reduced, while there is population growth in the municipalities of São Vicente, Guarujá and mainly Praia Grande, as shown in Table 2.

The inflection of growth in Santos resulted from the dynamics of property prices in the municipality and marks the strengthening of the dispersed regional occupation process that started in the 1960s (see previous section). Lower-income population migrates to neighboring municipalities where real estate is cheaper and where it is still possible to occupy irregular areas that are not of interest for the real estate market. Graph 1 shows the change in population distribution and allows comparing the drop of Santos in the ranking of regional demographic distribution in the period between 1980 and 2010, and the increased participation of other municipalities, especially Praia Grande.

While it shows stability with little population growth, Santos showed an increased production of residences for permanent occupation like in the other three municipalities. Despite Santos being the largest city in terms of population and economic development, it had the smallest demographic growth, both proportionally and in absolute figures, with an increase of only 2,719 new residents and the production of 37,839 new permanent residences between 1980 and 2010.

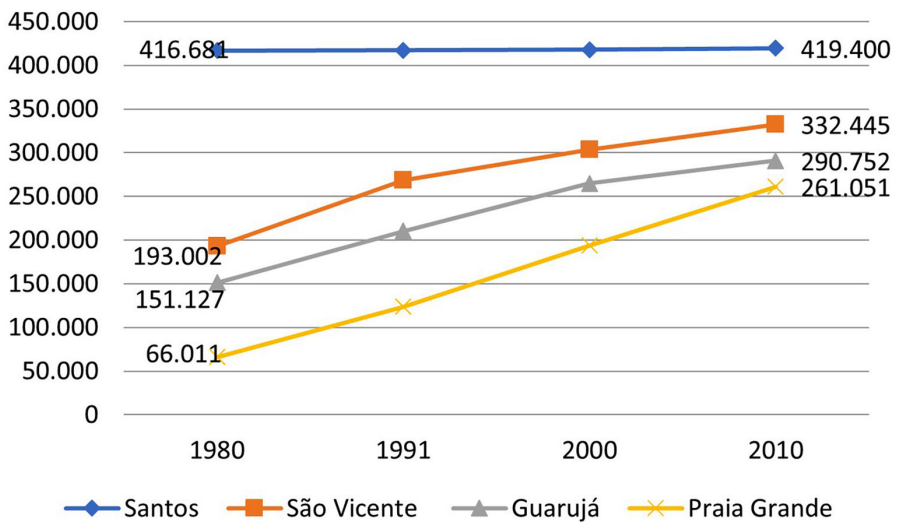
In contrast, Praia Grande was the municipality with the highest demographic growth, from 66,011 residents in 1980 to 261,051 in 2010, multiplying by almost four times the population. The proportion of

Graph 1 – Demographic Distribution of Municipalities in the RMBS Central Area – 1980-2010 (%)



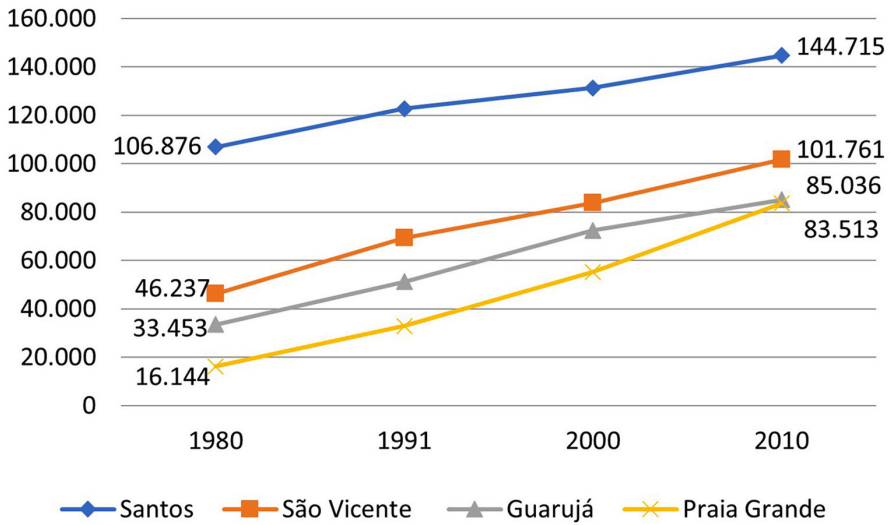
Source: Demographic Census (IBGE, 1980 and 2010). Prepared by the authors in 2021,

Graph 2 - Population per municipality in the RMBS central area 1980-2010



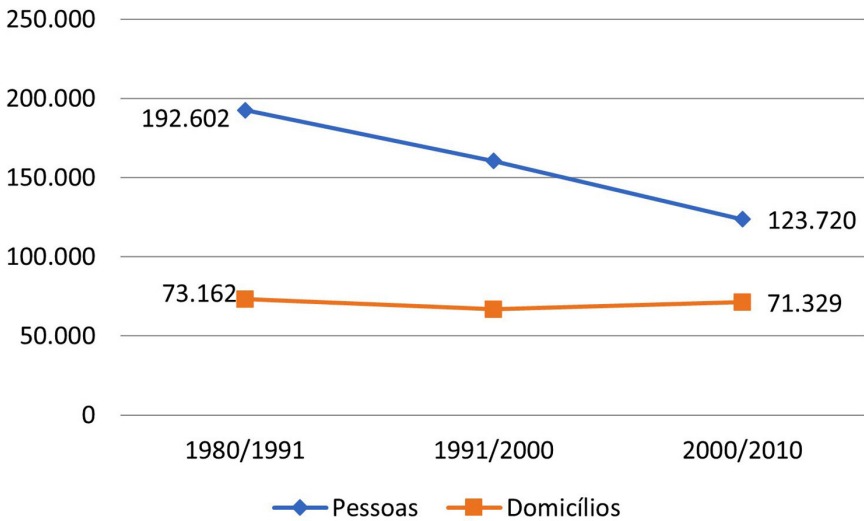
Source: Demographic Census (IBGE, 1980, 1991, 2000 and Sidra-IBGE, 2010). Prepared by the authors in 2021.

Graph 3 – Permanent private residences per municipality in the RMBS central area – 1980-2010



Source: Demographic Census (IBGE, 1980, 1991, 2000 and Sidra-IBGE, 2010). Prepared by the authors in 2021.

Graph 4 – Increase in population and residences in the RMBS central municipalities – 1980-2010



Source: Demographic Census (IBGE, 1980, 1991, 2000 and Sidra-IBGE, 2010). Prepared by the authors in 2021.

permanent residences is even higher, from 16,144 residences in 1980 to 83,513 in 2010, five times higher.

On a regional scale, there is a reduction of population growth in the period 1991-2010, and the growth rates are almost the same regarding residences between 1980 and 2010 (Graph 4).

As for the average number of people per residence, the reduction that occurred in Brazil (from 3.79 persons/residence,⁸ in 2000, to 3.37 persons/residence in 2010)⁹ is repeated at different scales in the RMBS central municipalities, such as shown in Table 3.

The mismatch between the increase of people and of residences in Santos becomes evident when the numbers are analyzed in more detail. In 2000, the average in Santos was 3.17 persons/residence, with a total population of 416,347 residents and 131,324 residences. In 2010, the average dropped to 2.89 persons/residence with a total of 417,864 residents and 144,715 residences, showing

a negative growth of -8.8% in the average number of people per residence, a growth of only 0.36% in population, while there is a growth of 10.2% of residences.

As for the spatial distribution of the residence growth, Figures 8 and 9 show the situation in 2000 and 2010, evidencing that the growth largely occurred due to the constructive densification of areas already occupied.

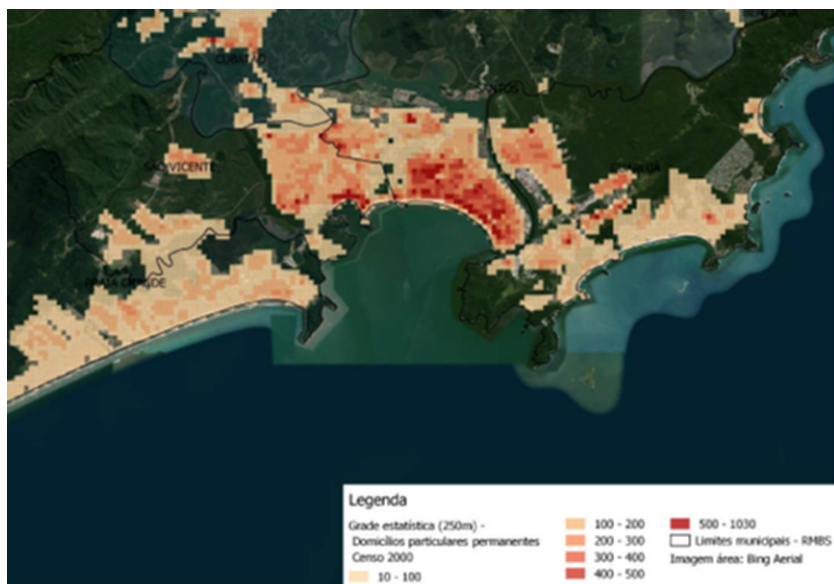
The maps in Figures 10 and 11 show that, in the period 2000-2010, Santos concentrated residences in apartments and that the production of this typology was expanded to Praia Grande, on the beachfront. It is noteworthy the emergence of vertical developments on the outskirts of the municipalities, particularly of São Vicente and Praia Grande, resulting from the production of housing projects by the governmental agencies Cohab Baixada Santista e Companhia de Desenvolvimento Habitacional e Urbano de SP (São Paulo State Company of Housing and Urban Development) (CDHU-SP).

Table 3 – Addition of people, residences, and average number of people per permanent residence in the RMBS central municipalities – 2000-2010

Municipalities	People Addition	Residence Addition	Average Persons / Residence – 2000	Average Persons / Residence – 2010
Santos	1,405	13,276	3,17	2,89
São Vicente	28,642	17,953	3,60	3,25
Guarujá	25,714	12,573	3,65	3,42
Praia Grande	67,809	28,212	3,49	3,13

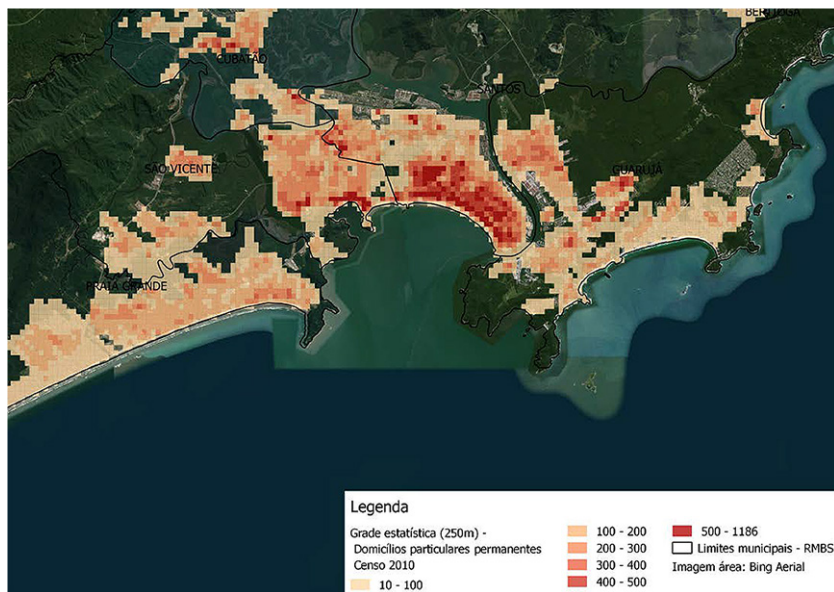
Source: Demographic Census (IBGE, 2000 and 2010). Prepared by Lenimar Gonçalves Rios in 2021.

Figure 8 – Permanent private residence in RMBS central municipalities – 2000



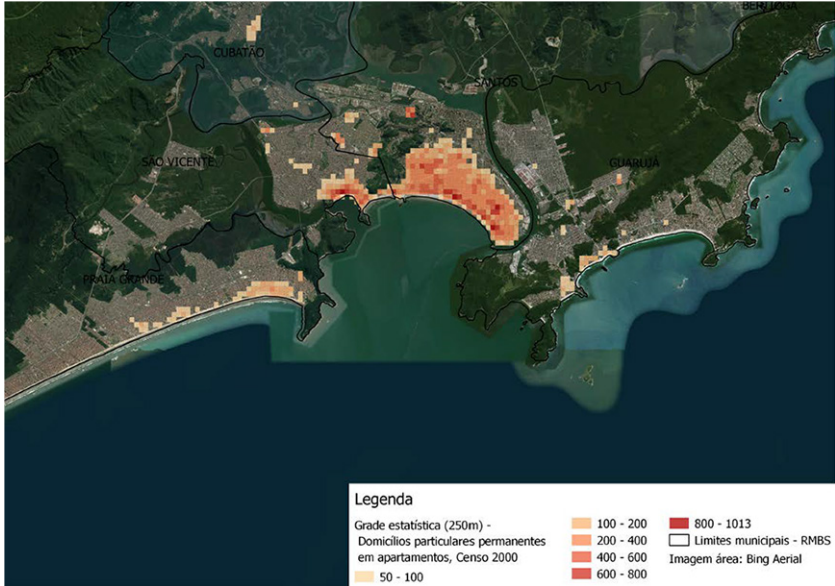
Source: Demographic Census (IBGE, 2000). Prepared by Gustavo Marques dos Santos in 2018.

Figure 9 – Permanent private residence in RMBS central municipalities – 2010



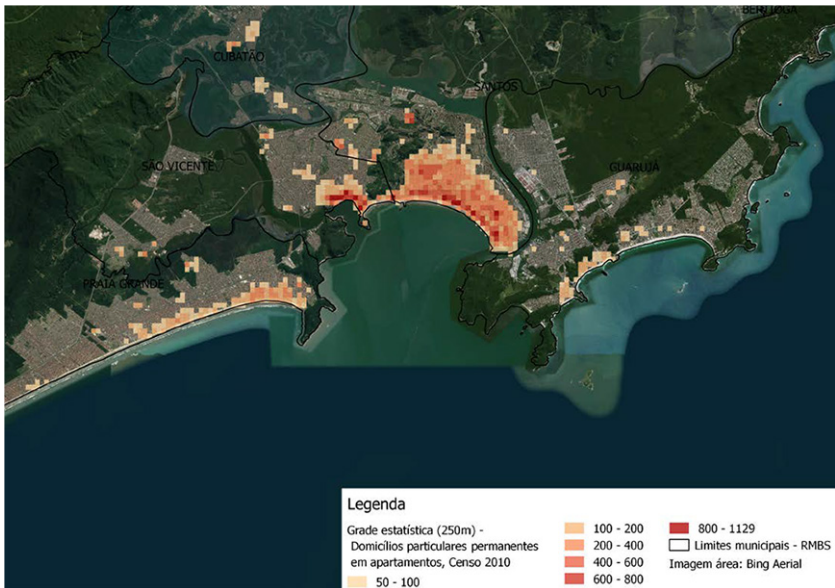
Source: Demographic Census (IBGE, 2010). Prepared by Gustavo Marques dos Santos in 2018.

Figure 10 – Permanent private residences in apartment buildings in RMBS central municipalities



Source: Demographic Census (IBGE, 2000). Prepared by Gustavo Marques dos Santos in 2018.

Figure 11 – Permanent private residences in apartment buildings in RMBS central municipalities



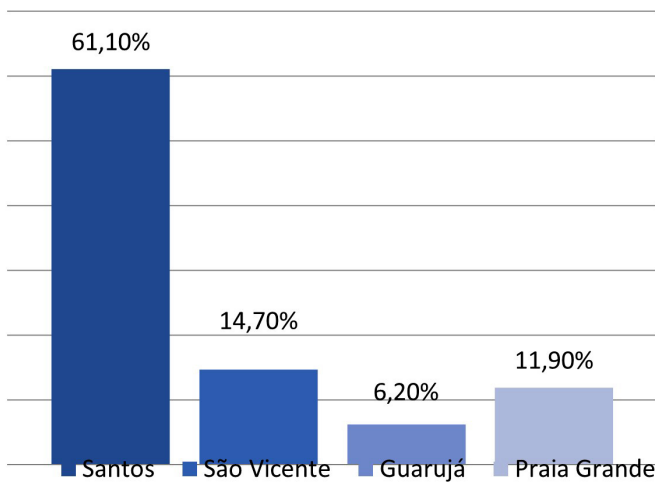
Source: Demographic Census (IBGE, 2010). Prepared by Gustavo Marques dos Santos in 2018.

Regarding the scale of the spatial growth, Graph 5 shows the incidence of residences in apartments in the central municipalities, in 2010. Santos is the most vertical city. It concentrated apartments, accumulating twice the total number of apartments of the other municipalities.

In Graph 6, it can be observed that, in the period 2000-2010, Santos concentrated the production of apartments and Praia Grande (mainly) and São Vicente are in the process of verticalization.

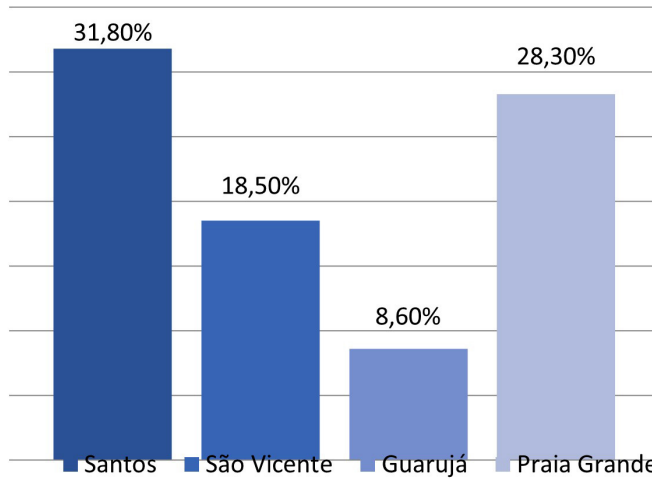
In short, since the 1960s, the high price of real estate in Santos has been an inducer of population migration to neighboring municipalities. In 2019, while the average price per square meter near the beachfront in the municipalities of RMBS central area was R\$5.8 thousand, in Santos it reached R\$7.5 thousand (Secovi-SP, 2019). These prices impact other municipalities and dictate the values in the rest of the territory, influencing the dynamics that induces the continuous verticalization, especially in Praia Grande.

Graph 5 – Apartments in the RMBS central municipalities - 2010



Source: Demographic Census (IBGE, 2011) – Universe – Tables 3341. Prepared by authors in 2021,

Graph 6 – Production of apartments in RMBS central municipalities, 2000-2010



Source: Demographic Census (IBGE, 2000 and 2010) – Universe – Tables 1434 and 3341. Prepared by Lenimar Gonçalves Rios in 2021.

Spatial and demographic growth projections 2010-2020

Before presenting the data in this section, it is important to point out that the best data source for demography and permanent use residences is the census. However, the 2020 census was not carried because of health issues, the Covid pandemic, and budgetary reasons. As a substitute for this study, the best statistical material found was the “Plano Municipal de Abastecimento de Água e Esgotamento Sanitário (Municipal Water

and Sewerage Systems Plan), 2017-2046” (Município..., 2017), where many of the statistical projections were extracted from Fundação Sistema Estadual de Análise de Data (Seade), requested by Sabesp.

Seade's projections for Sabesp, for the period 2010-2020, point out a slight increase in the geometric annual growth rates for the municipalities of Santos, São Vicente and Guarujá (Table 4), which has been in decline since 1991 (Table 2). For Praia Grande, the projection is of a drop in the population growth pace, which, even so, is estimated to have a much higher rate than the other municipalities.

As for residences, projections indicate that the ratio of new residences and addition of people will not show significant changes in relation to the previous period, except for Santos.

Based on these projections, Santos should experience a reversal in the discrepancy observed in the period 2000-2010. For an increase of 9,315 people, an increase of 9,429 residences is estimated. For Praia Grande, projections indicate a reduction of the number of people and new residences produced in relation to the previous period.

In the first half of the study period, the local real estate market was strongly influenced by the expectation of a new expansion of the port and the exploration of oil and gas in the Santos basin, which even led to the installation of a Petrobras business office in Santos, with the construction of a Petrobras headquarters in the Valongo neighborhood, the traditional city center. “Baixada Santista has its eyes on the future, as the prospects are even better with the exploration of oil and gas in the Santos basin” (Zarif, 2012).

At the national level, the market was experiencing a moment of great incentive to housing production. In 2002, the real estate financing with funds from savings accounts, which was in crisis since 1986 when the National Housing Bank - BNH was extinguished, was resumed. “The growth of funding has been exponential” (Meyer et al., 2013).

In 2007, financing operations were leveraged with an increased number of participant families in view of the reduction of interest rates and installments. “Developers increased their supply to the middleclass and began to operate to new income segments” (ibid.).

Under these circumstances, early in that decade, Santos produced 53.1% of the residences in the region and Praia Grande, 32.7%. In Santos, the highlights are 2 and 3 bedroom units, and even 4 bedroom units, which fall into the high standard category, which production was stimulated by the “good winds” that blew over the local and national economy. In Praia Grande, 2 and 3 bedroom units were produced, besides the largest number of 1 bedroom units in the region (Zarif, 2011).

In the ranking of the 14 Brazilian cities with the most expensive square meter in 2013 and 2014 (Yasbek, 2016, apud Marun and Viana, 2020),¹⁰ Santos ranked eighth in 2013, with the price per m² estimated at R\$6,230; São Vicente appears in eleventh place, with the price per m² estimated at R\$5,500; and Guarujá, in thirteenth place, with the price per m² at R\$5,320. In 2014, only the municipality of Santos appears on the list in fourteenth place, with the price per square meter estimated at R\$4,876. When comparing the data, it becomes clear that in the period of just one year, between 2013 and 2014, the value of the m² suffered a large drop due to the political and financial crisis experienced by the country, resulting in a process of economic recession (ibid.).

In the period from 2013 to 2015, according to Secovi-SP (2016), Praia Grande showed the best performance in launches and sales, although 2015 marked the downturn in the real estate business because of the rising inflation and interest rates, factors that influenced the volume of launches and sales (Petrucci, 2015).

However, ever since, Praia Grande took the lead in this production, with 50% of new residences, followed by Santos with

Table 4 – Permanent population and geometric annual growth rate in the RMBS central municipalities – 2010-2020

Municipalities	Population 2010*	Projection 2020**	TGCA***
Santos	419,388	428,703	0,33
São Vicente	332,193	357,929	1,03
Guarujá	290,526	316,405	1,05
Praia Grande	261,391	316,844	2,35

Source: (*) Demographic Census (IBGE, 2010). (**) Projection for 2020 prepared by the State Data Analysis System Foundation (Seade) for Sabesp (Município..., 2017). (***) TGCA 2010-2020, prepared by the authors.

Table 5 – Permanent Private Residences 2010-2020

Municipalities	2010*	2020**
Santos	144,600	154,029
São Vicente	101,697	120,424
Guarujá	84,968	103,296
Praia Grande	83,445	108,356

Source: (*) Demographic Census (IBGE, 2010). (**) Projection prepared by the State Data Analysis System Foundation (Seade) for Sabesp, available at: Município da Estância Balneária de Praia Grande (2017).

Table 6 – Addition of people and residences 2010-2020

Municipalities	Addition of people	Addition of residences
Santos	9,315	9,429
São Vicente	25,736	18,727
Guarujá	25,879	18,328
Praia Grande	55,453	24,911

Source: Município da Estância Balneária de Praia Grande (2017). Prepared by the authors.

33%, Guarujá with 13% and São Vicente with 4%. The phase when Praia Grande surpasses Santos in launches and sales of housing units begins (Secovi, 2016).

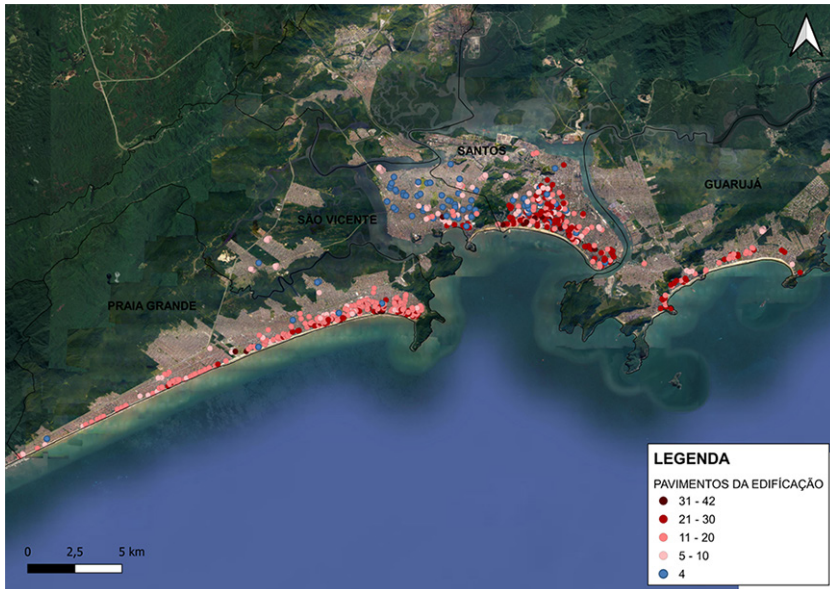
Today, 99.5% of the residences produced by developers in central municipalities are vertical. Horizontal properties comprise 1.78% of the launches (Zarif, 2014).

On the map in Figure 12, we see the vertical projects built in the period 2009-2020 in the RMBS central municipalities. Examining the typological characteristics and the distribution in the municipalities, we observe that, in Santos, the new projects concentrated in the eastern portion of the city and are

expanding towards the degraded residential areas of the old downtown. The predominant typologies are 10 to 20 floor and 20 to 30 floor buildings. In São Vicente, the production of 4 floor buildings stands out, many of them occupying areas with drainage problems, which cause recurring problems in the entire city. In Praia Grande, 10 to 20 floor buildings, close to the beachfront, were predominantly produced.

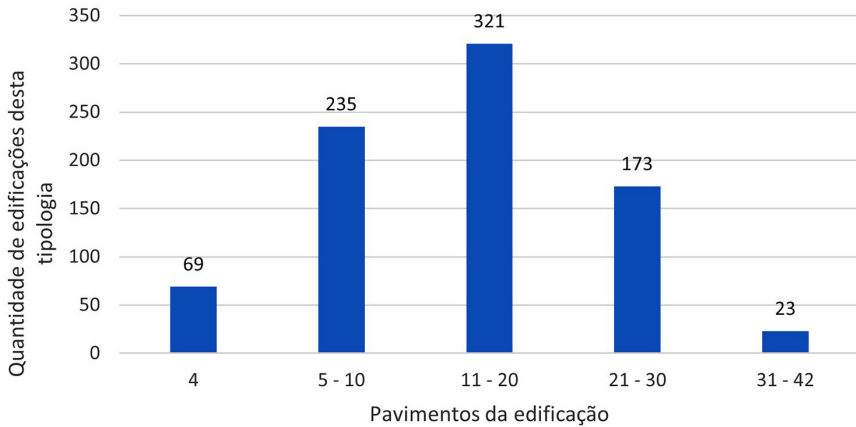
Regarding the scale, based on the data from the map in Figure 11, Graph 7 shows the incidence of the various typologies in the set of central municipalities. There is a predominance of highly dense constructions, particularly of 10 and 20 floor buildings.

Figure 12 – 4 floor or higher buildings built in the municipalities of Praia Grande, São Vicente, Santos, and Guarujá from June 2009 to 2021



Source: Google Earth 2009/2020. Prepared by Alexandre Lukas Morrone in 2021.

Graph 7 – 4 floor or higher buildings built in the municipalities built in the municipalities of Praia Grande, São Vicente, Santos, and Guarujá from June 2009 to 2021



Source: Google Earth 2020. Prepared by Alexandre Lukas Morrone in 2021.

Table 7 – Arrangement of buildings produced in Santos from June 2009 to 2021

Floors	Total buildings	Area A*	Area A%*	Area B**	Area B%**
4	23	7	30,43	16	69,57
5 - 10	74	13	17,57	61	82,43
11 - 20	66	51	77,27	15	22,73
21 - 30	97	76	78,35	21	21,65
31 - 40	16	16	100,00	0	0,00
Total	286	163	56,99	123	43,01

Source: prepared by Alexandre Lukas Morrone. (*) Area between Av. Gal. Francisco Glycerio, Av. Affonso Penna, and the beachfront (Av. Pres. Wilson, Av. Vicente de Carvalho, Av. Bartolomeu de Gusmão and Av. Alm. Saldanha da Gama). (**) rest of the urban area of the Municipality of Santos.

In the period from 2010 to 2020, not only the rationale of the “wall that surrounds the sea” was maintained, but it also had an intense growth, with most of the new buildings and especially the tallest ones being built up to 1 km from the beachfront. In Guarujá, except for the housing complex north to the Jardim Virgínia and Condomínio Rouxinol, in Jardim dos Pássaros, all new residential buildings were built up to 750 meters from the beachfront.

In Praia Grande, this phenomenon is even more intense. Of the 356 new buildings identified, 339 are between the beachfront and Avenida Presidente Kennedy, which runs parallel to the beachfront at an average distance of 650 meters; only 17 buildings are a little further away.

In Santos and São Vicente, this phenomenon is also observed, but in a less intense and clear way, as new buildings are found throughout the whole urban territory of such municipalities. In São Vicente, the tallest buildings, between 10 to 40 floors, totaling 14, are located up to 1 km from Gonzaguinha beach in the city’s central district. The remaining 141 new buildings are social housing projects (HIS) and small buildings, also residential, produced by the private sector; all with 4 or 5 floors and spread throughout the urban fabric. The local population affectionately calls these buildings “Predinhos” (Little Buildings).

In Santos, most of the buildings were also produced close to the beachfront, up to 1.4 km from it. But the production of these buildings took place in a much more homogeneous way throughout the urban area of Santos, in comparison to the other studied municipalities. If we analyze the area between the beach front and the avenues General Francisco Glicério and Affonso Penna, which is at most 1.57 km

distant, 163 buildings were produced, 56.99% of the total 286 buildings produced in the entire municipality of Santos. Like in São Vicente, in Santos the biggest discrepancy is related to the building typology, the majority of which have 4 to 10 floors, produced to the north of the avenues General Francisco Glicério and Affonso Penna. Most of the buildings with more than 11 floors were produced between these avenues and the seafront, and all buildings with more than 30 floors are less than 600 meters from the beach.

Final considerations

The studies carried out in this phase of the research show that the verticalization and densification process of the central municipalities of Baixada Santista Metropolitan Region is undergoing changes since the 1980s, with reflections on the socio-spatial structuring and the environment. The observed changes do not occur in the development and expansion model, which continues to produce verticalization and regional dispersion, but in the direction of verticalization.

Although in recent decades, Santos has dropped in the region’s population ranking, due to the decreased annual population growth rate, the municipality remains as a regional hub, concentrating the best infrastructure, urban equipment and the main economic activities that create jobs. However, Santos continues to expel the younger and lower-income population to other municipalities, especially São Vicente and Praia Grande, which increases the commuting between Santos and such other municipalities.

On the other hand, Praia Grande has a growth of its permanent population, because of the inflow of residents overflowing from Santos, causing the municipality to transition from predominantly touristic to residential, on the way to becoming a “dormitory city”, just like São Vicente.

In Santos, the production of the real estate market is verticalizing the last residential expansion frontier of the island’s eastern portion (also called prime portion) and is advancing around the axis of the VLT (Light Rail Vehicle – medium capacity rapid transport) line that connects Santos and São Vicente. However, it does not advance to the west of Santos territory, known as the northwest zone, where, in addition to be geographically continuous, real estate is cheaper, largely due to the poor quality of the installed infrastructure, and because part of the land is below the sea level, therefore subject to flooding. Public authorities’ activities to correct these problems have been slow and discontinuous – there are projects dated as back as the 1990s that only recently began to be taken off the drawing board. The real estate market is not showing interest in investing in this area, in which verticalized properties have been the result of housing projects undertaken by Cohab and CDHU. The northwest zone is the region of Santos concentrating most of the housing projects,

since the 1970s, and approximately 120 thousand residents, representing almost 30% of the entire municipal population.

As a result, the new residential expansion frontier in Santos ignores the geographic continuity. Guided by the interests of the real estate market, the residential expansion “takes a leap” over the areas close to the jobs, goes beyond the barrier of the channel that separates the island of São Vicente and the mainland, and reaches Praia Grande, which now has the voids next to the beachfront occupied by vertical residential developments. The areas where densification occurs are those originally intended for the so-called second residences, which, since the beginning of the urbanization process, have been occupied following a combination of legal parameters and public investments that transform them into spaces of excellence.

Thus, the verticalization of the region’s occupation has reinforced the single-functionality and car dependence features, leading to a greater commuting time, and worsening mobility and car pollution problems in Santos. These problems also affect São Vicente, a transit area between Praia Grande and Santos.

From a socio-spatial point of view, it is possible to observe signs of gentrification both in Santos and in Praia Grande, which points to the need for new investigations to verify possible territorial effects of this phenomenon.

[I] <https://orcid.org/0000-0001-5069-7174>

Universidade Católica de Santos, curso de Arquitetura e Urbanismo. Santos, SP/Brasil.

lenimar.rios@gmail.com

[II] <https://orcid.org/0000-0002-5297-5091>

Universidade Católica de Santos, cursos de Arquitetura e Urbanismo e Engenharia Ambiental. Santos, SP/Brasil.

moviana@uol.com.br

[III] <https://orcid.org/0000-0003-1547-6338>

Universidade de São Paulo, Faculdade de Arquitetura e Urbanismo, Grupo de Pesquisa Processo de Produção do Espaço Construído. São Paulo, SP/Brasil.

alm089@hotmail.com

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Notes

- (1) RMBS, comprised by nine municipalities (Bertioga, Cubatão, Guarujá, Itanhaém, Mongaguá, Peruíbe, Praia Grande, São Vicente, and Santos), was formally instituted by the supplementary law n. 815, on July 30, 1996. It is the first metropolitan region to be created having a municipality, Santos, as the hub and not the state capital.
- (2) According to survey performed by ZAP Imóveis, which has detailed the data of the last Census performed by IBGE and created the ranking. Available at: <https://www.diariodolitoral.com.br/cotidiano/santos-e-a-cidade-mais-verticalizada-do-brasil-aponta-pesquisa/117399/>. Accessed in: Mar 2019.
- (3) They constitute Houses of Occasional Use as defined by the IBGE.
- (4) The research group Observatório Socioespacial da Baixada Santista of the Catholic University of Santos – Observa BS was created in 2015 and studies urban issues, focusing on the Metropolitan Region of Baixada Santista – RMBS and its nine municipalities.
- (5) The municipality of Cubatão will not be addressed in this research, as it does not present a relevant number of vertical buildings. It is an industrial municipality, which has different dynamics from the other municipalities in the region, which, due to their beaches, are recognized as Seaside Resorts by the state government of São Paulo.
- (6) During this period, the following municipalities were emancipated from Santos: Guarujá (1947) and Cubatão (1948); from São Vicente: Itanhaém (1958) and Praia Grande (1967); from Itanhaém: Mongaguá and Peruíbe (1959). Bertioga, district of Santos, was the last to be emancipated (1992).

- (7) Regarding seaside tourism, it is worth noting that eight of the nine municipalities that make up the RMBS are seaside resorts.
- (8) Source: sidra.ibge.gov.br/tabela/156#resultado. Accessed in: Mar 2021.
- (9) Source: sidra.ibge.gov.br/tabela/3451*resultado. Accessed in: Mar 2021.
- (10) Ranking prepared by Marum, in 2017, based on studies by Yasbek (2016b, Table 2, p. 635). Available at: <https://revistas.pucsp.br/index.php/metropole/article/view/2236-9996.2020-4813/pdf>. Accessed on: March 19, 2021.

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