A NEW ISSUE FOR TRANSPORT MOBILITY AND SPATIAL SEGREGATION AGENDA: THE CONFIGURATIONAL FOCUS

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ABSTRACT

This article investigates the use of the configurational variable, which deals with the city form-space relations regarding transportation issues, to study spatial segregation and urban mobility in 4 Brazilian cities (Belém, Manaus, Recife and São Paulo), with a focus in precarious settlements and in the location of social classes in the urban space and their relative degree of accessibility/integration to the city as a whole.

The study is part of a bigger project of the Institute of Applied Economic Research (IPEA) called “Characterization and Typology of Precarious Settlements in Brazil” and searches to verify to what extent such settlements are more segregated/isolated in the urban fabric as compared to the other areas of the city. For this purpose, we have used the classification of census tracts prepared by the Centro de Estudos da Metrópole (CEM) of the Ministry of Cities of Brazil (CEM, 2007), based upon microdata from the demographic census of the Brazilian Census Bureau (IBGE), as well as axial maps of these cities, according to the methodological tools of the Theory of the Social Logic of Space, which allows quantifying the configurational variable by means of the so-called “integration value”. The confrontation of the information, organized on a Geographical Informational System (GIS), has underpinned a series of interpretations over the existing process of “voluntary” and “involuntary” segregation in such cities, highlighting the importance of the city form-space for urban studies of such nature.

The first section presents a general introduction about the themes of precarious settlements, spatial structure of cities and urban mobility, in the light of the urbanization process in Brazil.

The methodological considerations relative to the space syntax and the procedures adopted in the study are described in section 2. Section 3 presents the preliminary results of the research for the 4 cities selected in the study, besides showing in more detail the case of São Paulo municipality, considering the results of a previous study by one of the authors about the integration values among the neighbourhoods of São Paulo municipality. Last, section 4 presents the main conclusions of the article.

Keywords: Urban mobility, space syntax, spatial segregation, accessibility, integration.

INTRODUCTION

The research presents a preliminary approach on the insertion of the configurational variable in studies on the locational pattern, the residential segregation and the integration value (road accessibility) of the precarious settlements in 4 Brazilian cities (Belém, Manaus, Recife and São Paulo) and their level of segregation/integration with the entire city.

In this study, precarious settlements are assumed to be the census tracts classified by IBGE (2000) as special sectors of substandard agglomerations[1], such as an "agglomeration constituted by a minimum of 51 dwelling units (shacks, houses) occupying until recently, land belonging to others (either public or private), generally disposed in a dense and wayward manner and lacking essential infrastructure services. They are also designated as informal settlements, slums ("favelas"), "mocambos", "alagados", etc., together with those sectors classified by the CEM as precarious ("those sectors identified by IBGE as regular but very similar to substandard sectors, according to socioeconomic, demographic and housing characteristics; MARQUES et al. 2007)[2].

The results related to the different types of census tracts and income levels of the household head in the 4 cities are then compared with the indicators of road accessibility (integration value). In the case of São Paulo we make a comparison of these indexes with the results of the integration indexes for the different neighborhoods of the city.

Our goal is to understand how the investigation of the different degrees of road accessibility distributed over the urban system, originated in the ways of articulation between the component elements of the city (spatial configuration), are able to reveal significant findings on the process of spatial segregation, which can contribute to the formulation, monitoring and

[1] For the 2000 census, IBGE divided Brazil in 215.811 census tracts (smaller spatial disaggregation for statistical information, that corresponds roughly to 300 households), classifying them as regular sectors and special sectors of substandard agglomerations, boats, camping grounds, prisons, asylums, indigenous camps etc. In Brazil there were 7.9891 census tracts classified as special sectors of substandard agglomerations by IBGE, 98% considered by CEM, that carried out the study considering the 56 municipalities with population over 150 thousand inhabitants in 2000 (MARQUES et al. 2007).

[2] For more details on the methodology and the variables used in the CEM study see FERREIRA et al (2007).

evaluation of initiatives, projects, programmes and urban policies. In this sense we intend to insert the discussion of how the road network structure (design/road layout), understood in its relational aspects, i.e., the interdependence between the diverse component parts, is able to interfere in the circulation aspects (mobility), accessibility (capacity to reach a certain place) and spatial segregation (distribution of individuals by income, social class, race or any other factor related to the physical separation of the distinct social groups in space, according to their local of residence/housing conditions).

It is well known that the rapid urbanization process in Brazil, especially in the last decades of 20th century, is due to a series of factors (1) great industrialization (2) rural-urban migration, (3) substantial demographic growth and (4) public policies, that, combined, favored the great transformation of the urban spaces in the country. The investigation of the Brazilian case reveals that this urbanization or growth had occurred in a very fast way, mainly between 1960 and 1980 (ROLNIK, 1998; VILLACA 2001; SANTOS, 2005), producing a contemporary scenario that poses several challenges to the improvement of the quality of life in the Brazilian cities.

One of the most visible consequences, corresponds to the process of spatial segregation which occurred in the urban space: the less favored strata tends to fix residence in the city suburbs or in slums in risk-prone areas or unsuitable for edification thanks to the high value of the urban land, which progressively fosters the apartheid between the periphery, the slums and the active centers – understood as that part of the city to where converge, in quantity and quality, diverse uses and different flows (HILLIER AND HANSON, 1984; HILLIER, 1996; TRIGUEIRO, 2001). In this Brazilian "sprawl", the great distances, besides triggering an increase in average commuting distances, progressively produce a fragmented urban space that, sets the different social groups apart (BARROS et. al., 2009; HOLANDA et al., 2008; MEDEIROS, 2006). Besides, it ends up causing serious externalities to the urban agglomerations, taking into account that they provoke (1) increased economic, social and environmental costs of urban transportation (infrastructure, maintenance, prices, urban sprawl, pollution and carbon emissions etc.), associated with (2) the process of reduction in the citizens capacity to move/circulate. Due to promotion of gradually greater distances, the movements to and from the central areas (but also to the diverse component parts of the city) are reduced, thus incurring serious implications to the urban mobility.

The definition of urban mobility is comprehensive and includes meanings related to the dynamics and permanence of the cities. Etymologically speaking, mobility relates to the movement or capacity to move which, in the end, includes the notions of circulation and accessibility in the urban space. Thus, above all, in the urban context, mobility is a mean, not an end. It incorporates a series of implications to mobility that enables the performance and the realization of social relations that exist in the city space. The analysis of the literature brings more specific meanings to urban mobility, that can be summarized by that one adopted by the MINISTRY OF CITIES (2005), defining urban mobility as "an attribute of the cities that refers to the facility of movements of people and goods in the urban space. Such movements are made through vehicles, routes and all related infrastructure such as

pavements, etc. that make possible this daily come and go. Is the result of the interaction of the movements/circulation of people and goods within the city (...)"

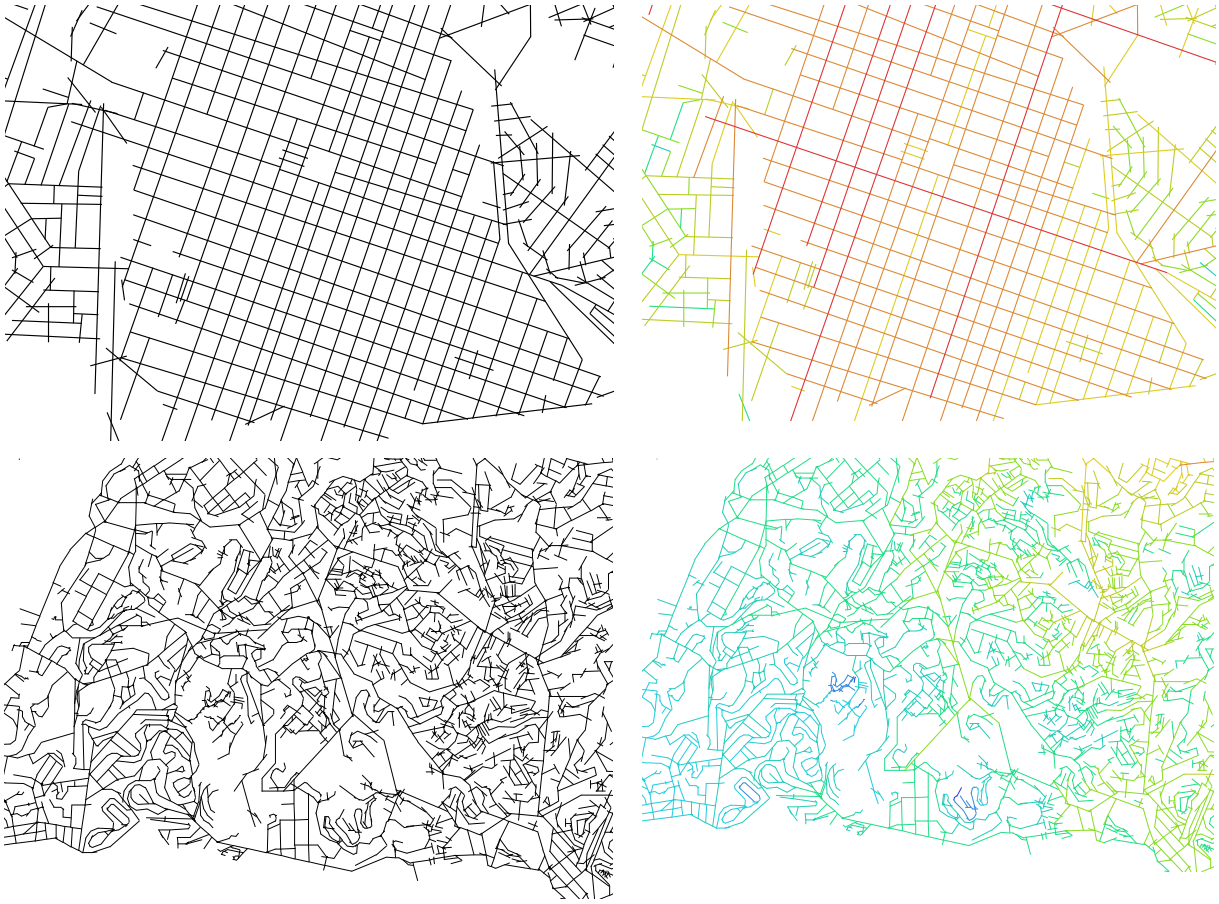


Figure 1 - Distinct spatial structures generate distinct patterns of movements (above Pelotas-RS and its regular grid in a chess table format; below, Salvador-BA and the significant irregularity of its street network map – the colors represent the potential movements: red colours means higher integration while blue colours means lower integration.

By this vision of the Ministry of Cities, the facility of movement seems to be exclusively a product of the components of infrastructure that serve as support to circulation, which reveals a strong content of space geometry, such as, the urban mobility as a dependent variable of the organization, function and performance of routes and pavements, etc. As observed, this concept is restricted to the transport field, and does not incorporate other features or variables that seem important to the evaluation of the capacity to move. According to VASCONCELLOS (2001), the interpretation of urban mobility needs to go beyond the questions that deal only with spatial geometry and space project and should incorporate variables such as land use, income, employment, age, gender, schooling, household size, etc.., expanding the items that influence the performance of such movements.

This paper presents precisely an effort in that direction, by incorporating in the study of urban mobility and accessibility, questions related to spatial segregation by census tract, neighborhood, and household income strata. To this set of variables that are important either by (1) questions of traffic engineering or (2) insertion of the socioeconomic aspects of the people involved, still lacks a view that incorporates the spatial structure of the city, in its

complex network of interactions, as a variable of significant importance to urban mobility – which implies, then, the insertion of the configurational variable in the analysis (Figure 1).

METHODOLOGICAL PROCEDURES

About the Theory of the Social Logic of Space

As a theoretical and methodological tool to discuss spatial segregation and road map configuration/form, we have adopted the Theory of the Social Logic of Space, more well-known as space syntax, that investigates the space from the social logic incorporated in it. For this research, it means to say that in the conception of urban space there are implicit (or explicit) social attributes that belong to the society that builds it, according to a series of expectations, including the ones of circulation.

The objective of the Space Syntax is to study the relations between the architectural space – also understood as the urban space – and society – seen as a system of the possibilities of meetings (HOLANDA, 2002). The creation of this theory, supported by systemic and structural thoughts (HILLIER et al., 1993; LEFEBRE, 1999), derives from the concern that according to HILLIER and HANSON (1997), "(…) the (space) theories had been extremely normative and less analytic".

We propose that, instead of postulating a formulation and trying to fit it in the urban space at any cost, it will be necessary to study the subject to its exhaustion, and try to find general properties of its related schemes (MEDEIROS, 2006). According to the authors of this theory, the gradual development of the techniques had convinced them that there is, in the investigation of space, a very important relational property called "configuration" (HILLIER and HANSON, 1997). Configuration, therefore, is a basic property found in the relations among city parts (blocks, streets, open spaces, etc.), revealing how different urban layout patterns produce distinguished relational performances. Configuration, based on this point of view, is a complex of interdependency relations in space with two fundamental properties – the configuration is different when seem from: (a) different points within the same system; and (b) only from a part of the system. Due to changes in one of the elements of the system or in one relation, the entire system can be altered in various degrees. The interpretation of the variations in the configuration can reveal attributes derived from the interaction of the space form and different processes associated to circulation, accessibility and urban mobility.

The investigation of these associations can reveal new interpretations about the urban phenomena, bringing information about the movement-related questions that occur in the city. About this subject, engineers, architects and urban planners, when looking at the space, several times do not understand that their focus of action emerge and are a product of a series of complex relations associating different components. Either the physical objects (buildings, neighborhoods, roads and circulation systems) or these relations are a product of the concept of space and represent properties closely related to their functioning.

In terms of tools, the Space Syntax, offers instruments to understand and represent the urban space. Among the recommended strategies, the linear representation is useful to investigate the movement and its related urban aspects and is the one that better applies to big systems and structures such as the city. The linear representation is obtained by drawing over the road network, from the available cartographic base, the smallest possible number of lines that represent the direct accesses through the urban space. After the processing of such lines, we can generate a matrix of intersections, from which are calculated, through especially programmed applications, values that correspond to their axial inter-relations (HILLIER and HANSON, 1984; HILLIER, 1996; HOLANDA 2002; MEDEIROS, 2006), representing the potential of attraction of the flows and movements of a certain axis within the urban system, called the value or potential of integration, accessibility or permeability. Such values can be represented numerically or by a chromatic scale with graduation going from red, passing through orange, green until reaching blue – where the more integrated axis tend to red and the less integrated to blue – what produces the so called axial map (Figure 2)

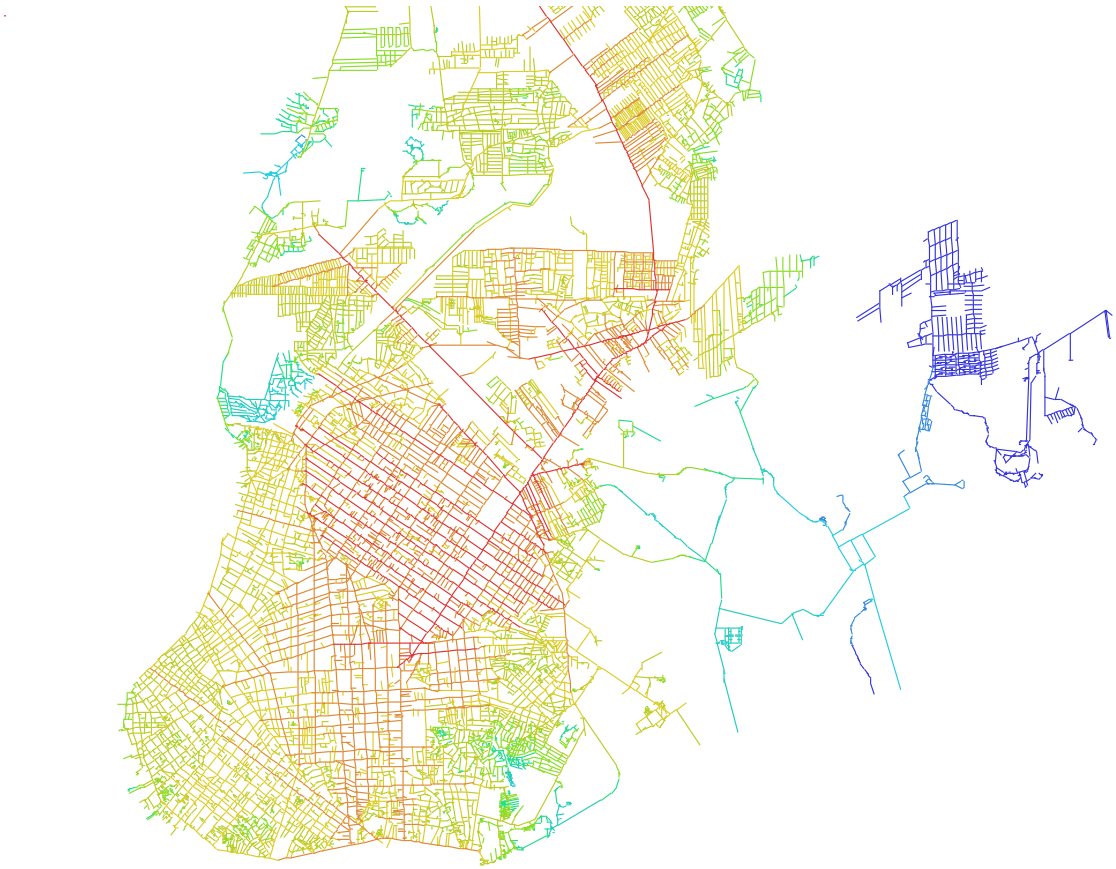


Figure 2 - Axial Map of the municipality of Belém – Pará.

The more integrated axis are those more permeable and accessible to the urban space, from where it is easier to reach the others. They imply, on average, the shorter topological ways to be reached from any other axis of the system. More integrated axis tend to assume a position of control, once they can connected themselves to a higher number of axis and hierarchically present a higher potential of integration. To the set of the more integrated axis is given the name of integration core.

From this information, one can be infer that from the procedures that investigate the configuration of the road network of a city, the simulations done by the Spatial Syntax are an instrument capable to measure, quantify and rank different levels of connections between each road and the system where it is inserted, establishing in such way correlations, connections and hierarchy between the roads and the urban complex (MEDEIROS, 2006). This allows, consequently, for the visualization of the road network in several gradations of the flows and movements potentials that is, integration. The definition of areas with a predominance of axis with high potential of movement, as opposed to those peripheral areas with less flows becomes visible. We have, in such way, a valuable tool to study urban mobility by facilitating that factors related to urban configuration can be quantified mathematically and easily visualized and therefore can be correlated with several information that involves movement and circulation.

Social Data Procedures

After the survey of the information on accessibility of the axial maps (derived from the study by MEDEIROS, 2006) for a) the urban systems as a whole b) the census tracts classified as substandard by IBGE c) the census tracts classified as precarious by CEM and d) the other urban sectors, the data was compared with information on head of household income in minimum wages, collected from CEM data base. Our objective was, then, to verify what are the most common patterns of spatial segregation, according to GIST and FAVA classification (apud VILLACA, 2001) in voluntary segregation (when the individual or the family opts for isolation) and involuntary segregation (when the individual or the family is forced to live in certain areas of the city). All the information was displayed in a GIS software, in order to help the visual and statistical correlation of the variables.

ANALYSIS AND MAIN RESULTS

This section presents the preliminary results of IPEA study on Space Syntax and residential segregation for the municipalities of Belém, Manaus, Recife and São Paulo. Table 1 shows the population living in precarious settlements, which corresponds to the sum of people living in IBGE substandard census tracts (A) and the sectors classified as precarious by CEM, whose socioeconomic characteristics are similar to substandard sectors (B). As we can see, the highest level of precarious housing in relative terms is found in the cities of the North region, mainly in Belém municipality, where more than half of the population lives in precarious settlements. São Paulo presents the highest absolute numbers of the problem, with almost 1.5 million people living in precarious settlements. Manaus and Recife also present a percentage of precarious housing above the national average (14.1%).

By analyzing the variables of head of household income level and type of sector versus the road accessibility[3] originated from the axial maps, one can notice that there is a positive correlation for all the cities studied, as there is a clear tendency of high income people or the residents of regular/ non-special census tracts (proxy for medium and high class neighborhoods) to locate near the more central areas or in areas of higher degree of accessibility. Such parts of the city, as revealed by the maps, coincide with the so called active centers or integration core, that is, areas with a higher number of roads potentially more accessible to the circulation system as a whole (red axis).

Table 1 – Population living in precarious settlements in urban areas (including rural areas of urban expansion), by sector and municipality- 2000

Municipality	**People in Substandard Sectors (A)**	**People in Precarious Sectors (B)**	**People in Precarious Settlements (A + B)**	**Total Population**	**% people living in precarious settlements**
Belém	447,915	205,039	652,954	1,268,230	51.49
Manaus	166,870	193,006	359,876	1,389,892	25.89
Recife	134,317	121,990	256,307	1,413,119	18.14
São Paulo	902,490	557,158	1,459,648	10,215,800	14.29

Source: CEM (2007), based on IBGE 2000 Census microdata. Elaboration: the authors.

For the 4 cities studied, we have observed that as the income level increases there is a tendency for a progressive increase in the average integration value, which means higher accessibility/proximity to the urban active center and therefore higher facility of movement (Figure 3). On the other hand, the smaller the income level the higher the distance to the urban center, expressing how much accessibility is a good indicator of social status in Brazil,

[3] The general measure of integration (road accessibility) for a system as a whole (like a city) is the mean *relative asymmetry* (RA) from all points in the system. To calculate RA proceed as follows:

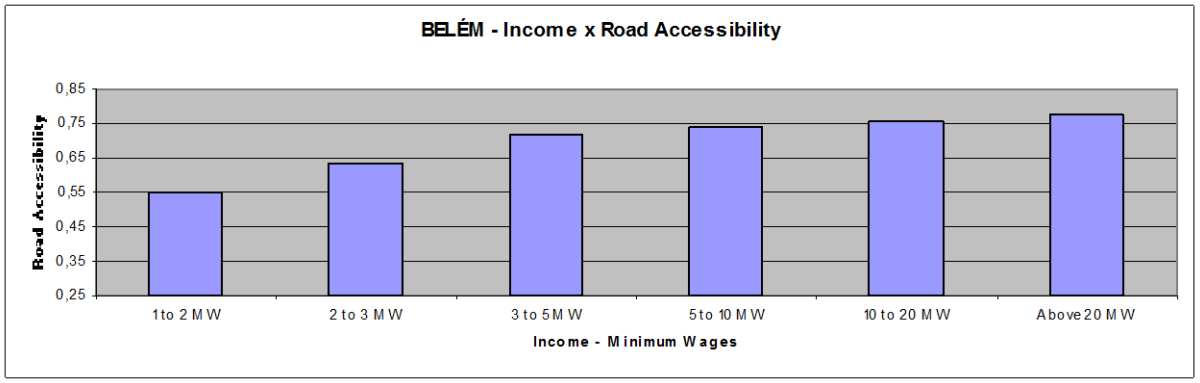
$$RA = \frac{2\,(MD - 1)}{k - 2}$$

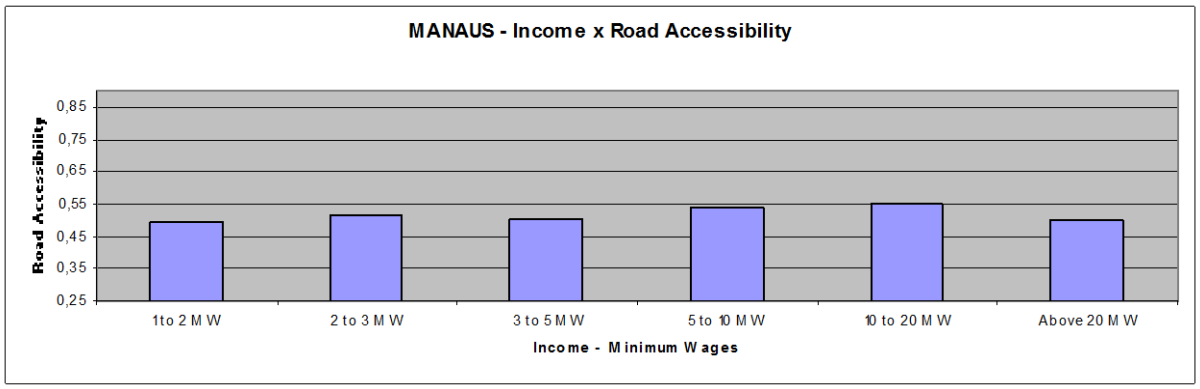
"Where MD is the *mean depth* and *k* the number of spaces in the system. This will give a value between 0 and 1, with low values indicating a space from which the system is shallow, that is a space which tends to integrate the system, and high values a space which tend to be segregated from the system. Relative asymmetry (or relative depth) can therefore be thought of more simply as the *'measure of integration'* […]. A key figure is the mean RA from all points in the system. This is the general measure of integration for the system as a whole" (HILLIER and HANSON, 1984, p. 108). "The *depth* between two points *a,b* of a complex *C* is noted as *D(a,b)* and is equal to the minimum number of connections that must be used to reach *b* from *a*, or *a* from *b*. The *mean depth* of a point *a* in a complex *C* is defined by the expression:

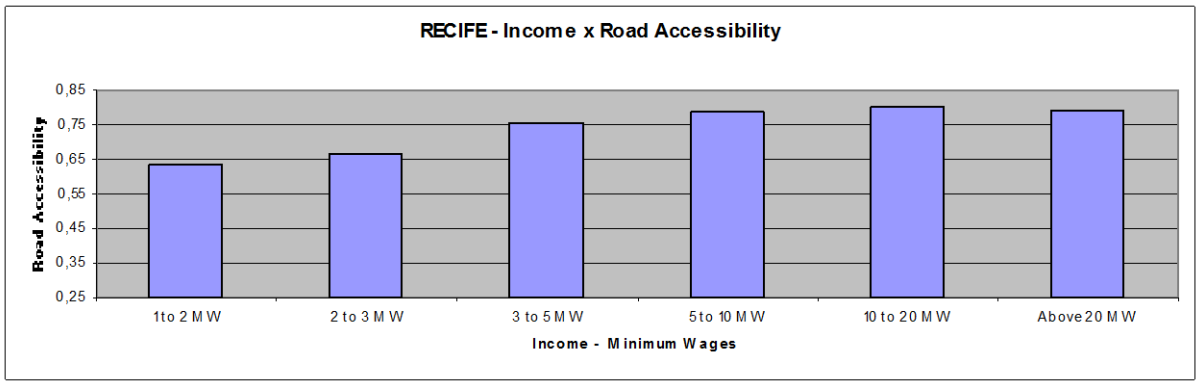
$$MD\,(a,C) = \frac{\sum_{bi \in C} D(a,bi)}{(k - 1)}$$

Where *k* = number of points in *C"* (cf. PEPONIS, 1985, p. 389).

except for the cases of voluntary segregation. Finally, accessibility is a good that is positively incorporated, especially by the real estate market and that is reflected in the price of housing.







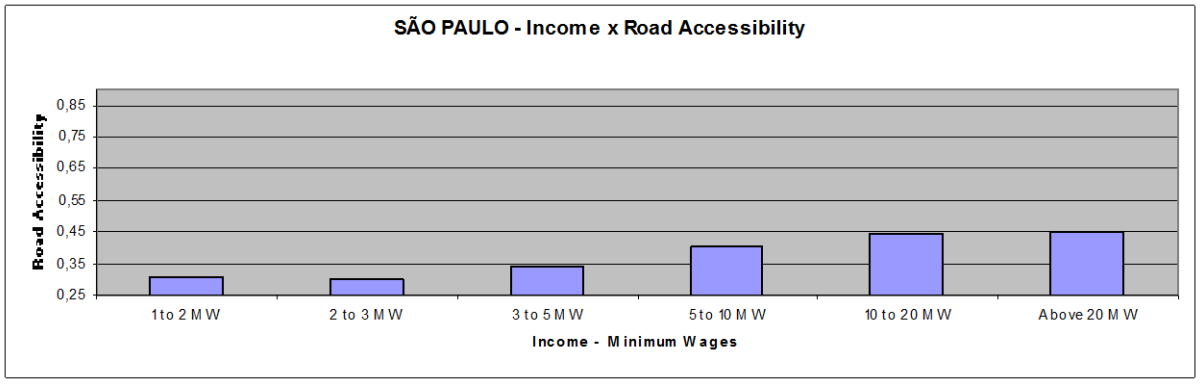


Figure 3 - Correlation between average head of household income (in minimum wages) and road accessibility.

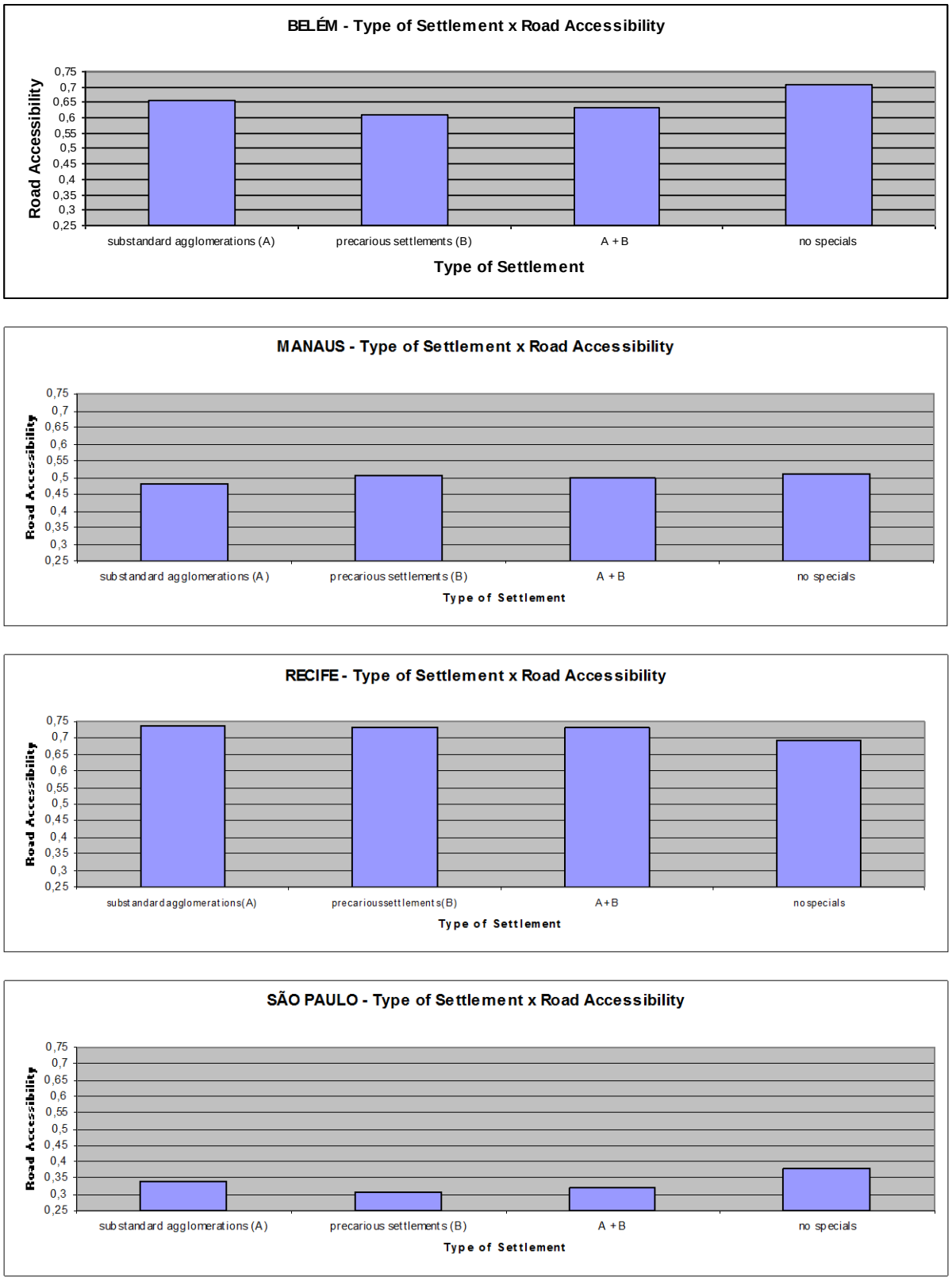


Figure 4 - Correlation between type of settlement and road accessibility.

When we observe the average degree of integration for CEM precarious tracts (proxy for peripheral allotments) and IBGE substandard sectors (proxy for slums) in relation to the averages for the regular/non-special sectors (proxy for medium and high income

neighborhoods) and for the city as a whole (Figure 4), except for Recife, where the location pattern of precarious settlements is relatively more central, it is perceptive how much these spaces related to precarious settlement belonging to A and B groups are less accessible and present lower integration averages, except when located near the city center, in marginal areas with steep slopes and riverbanks and lakesides, mainly. On average, in general, the IBGE substandard sectors present more central locations when compared to CEM precarious sectors, which corroborates the results of other studies on the subject, that argue that the population living in slums look for locations near employment centers (MORAIS et al. 2003).

In Belém, for instance, the study confirms that medium and high income classes (head of household income above 20 minimum wages) are located in the prime areas of the city (Nazaré and Batista Campos neighborhoods), located near the integration core (Figures 5 and 6). Even at a smaller scale, there are also sectors of closed-in condominiums, with high household income levels, located in peripheral areas such as Parque Verde neighborhood, which represents the scenario of voluntary segregation in the so-called fortified enclaves or gated communities, as CALDEIRA (2000) defines.

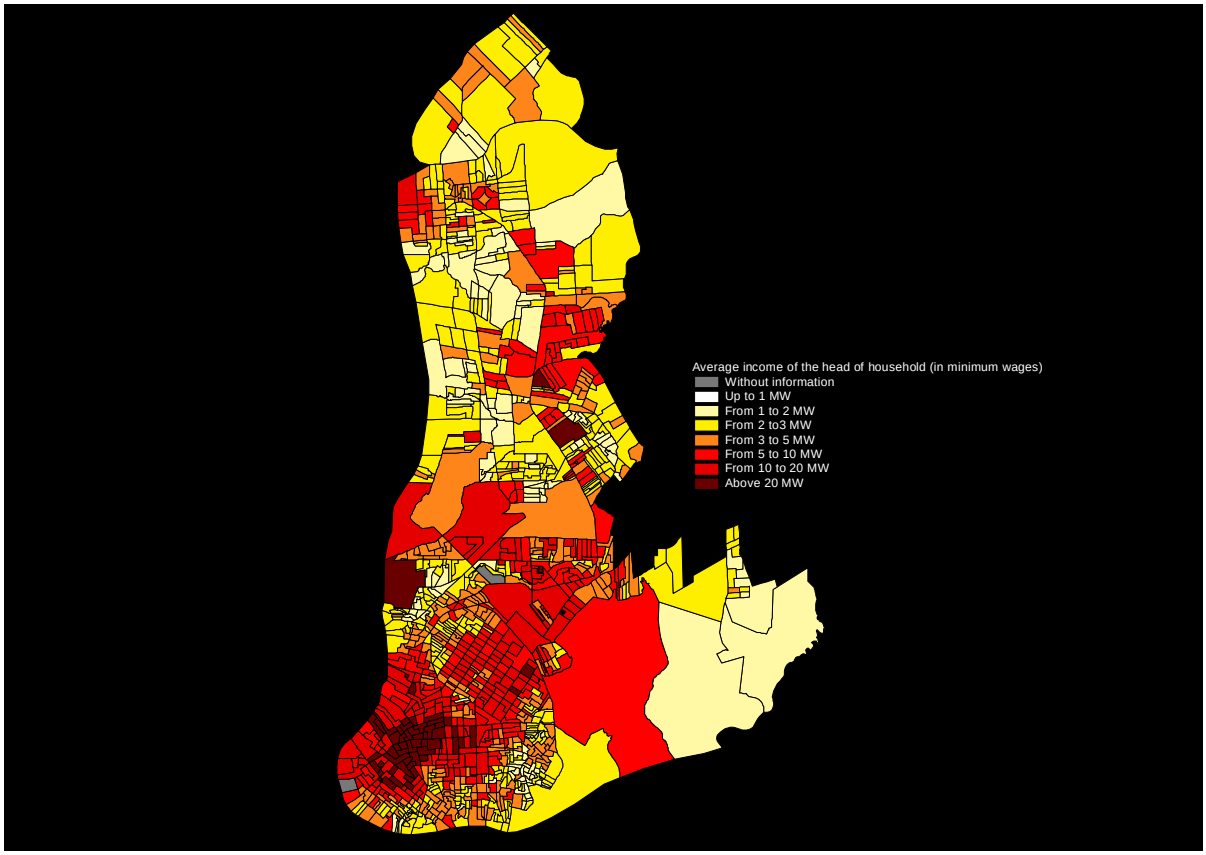


Figure 5 - Belém: average income of the head of household (in minimum wages).

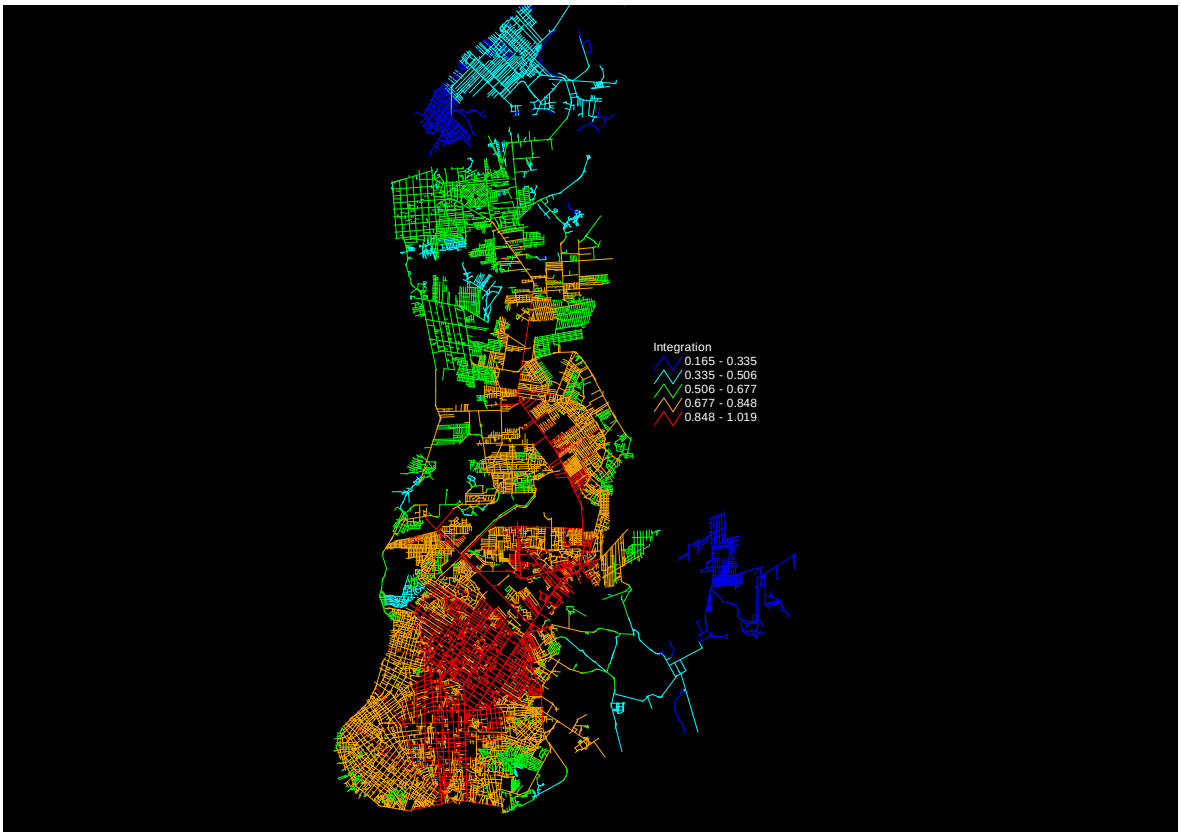


Figure 6 - Belém: axial map.

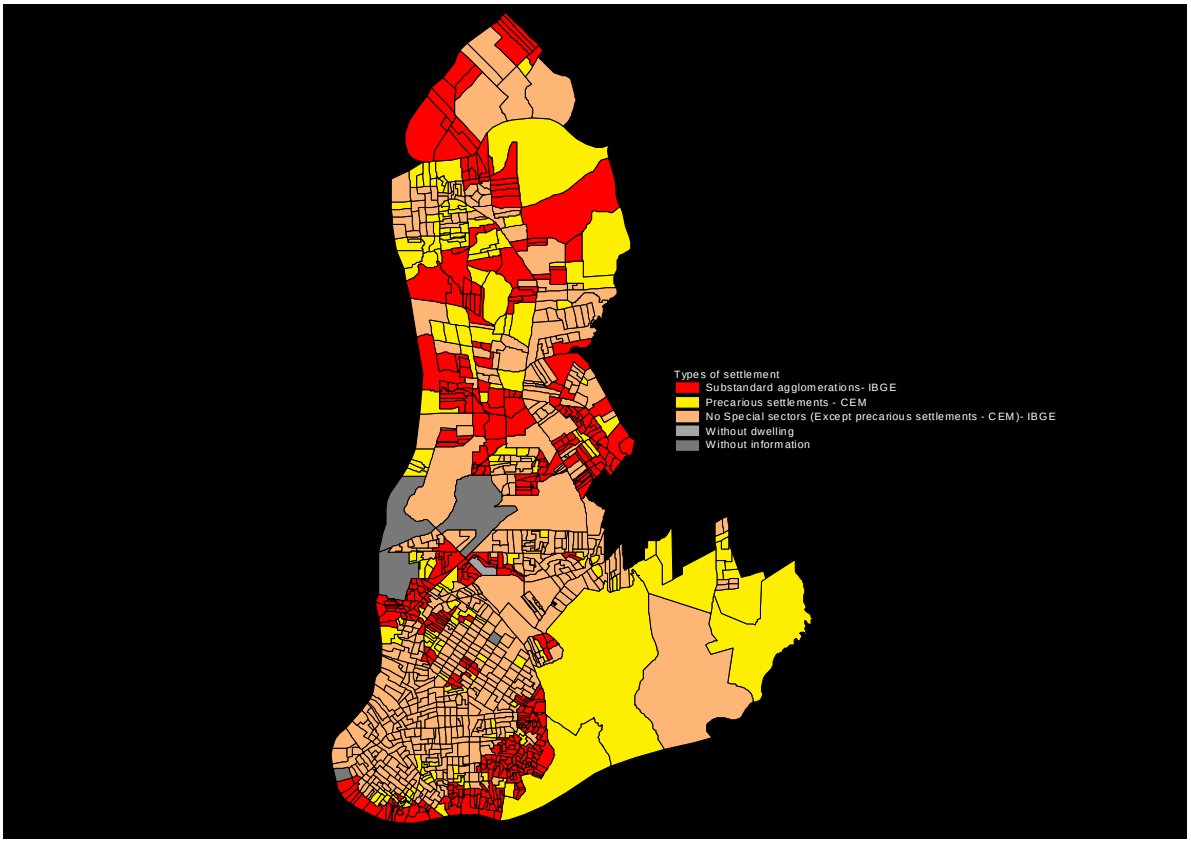


Figure 7 - Belém: type of settlement.

It is important to clarify, however, that such scenario of voluntary segregation is relative, because despite the longer distance, such areas tend to be accessible from express roads that reduce distance, like the BR 316 Highway, that acts as the continuation of Almirante Barroso Avenue and penetrates Belém, in the form of one of the highest accessible road of the system. On the opposite side, cases of involuntary segregation are located in the neighborhoods of Terra Firme and Guamá, with low accessibility in relation to the entire urban system, that present average household income of around 1 to 3 minimum wages, conforming patterns of precarious settlements (Figure 7).

In Manaus, the medium income and medium-high income classes are located near the urban center, accompanying its active center or integration core (Figures 8 and 9), and its distribution can be considered as dispersed when compared to Belém. In Manaus volunteer segregation also occurs, especially in the Ponta Negra neighborhood in the western part of the city, that concentrates a good portion of the population whose the head of household average income level is above 20 minimum wages. The lower income classes are located near the center to the south, occupying marginal areas derived from land-filled water streams, or more distant areas to the north and the east, which can be noticed by the strong presence of precarious and substandard sectors in those areas (Figure 10).

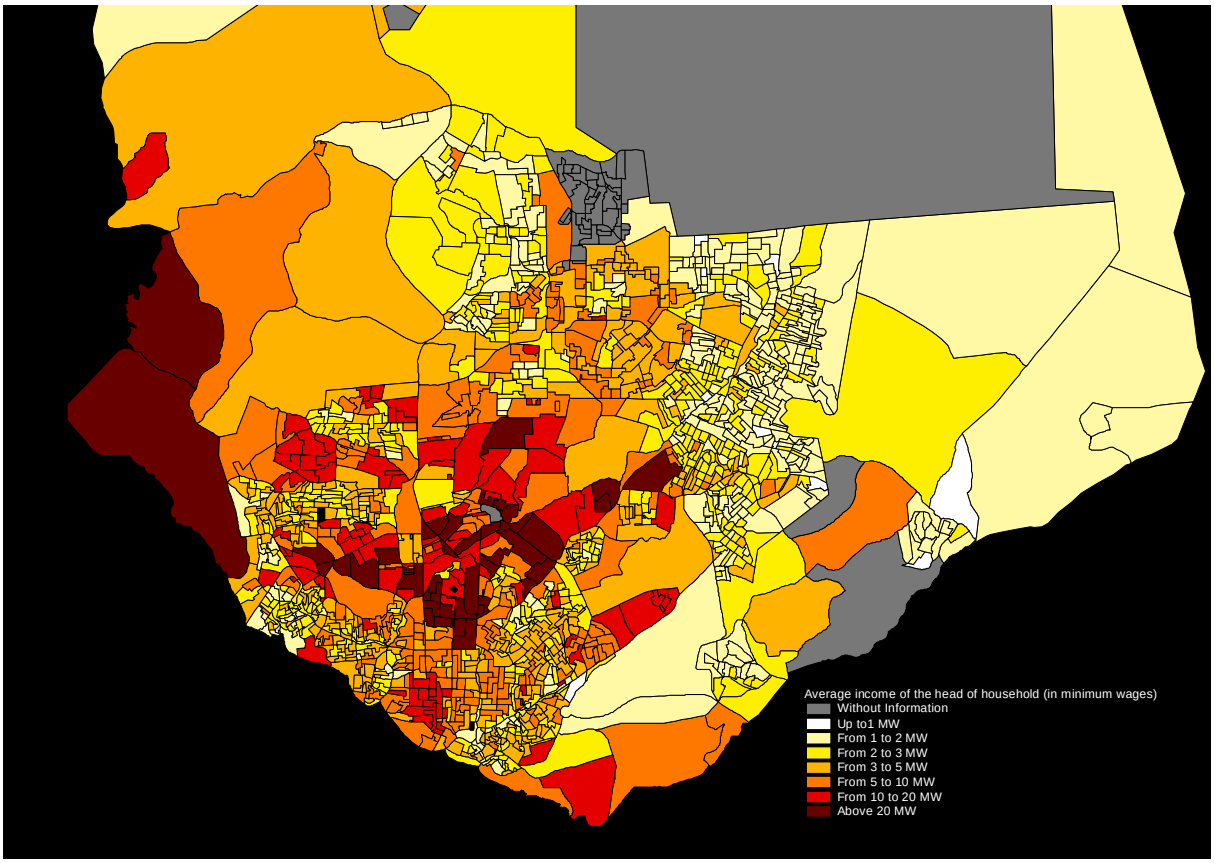


Figure 8 - Manaus: average income of the head of household (in minimum wages).

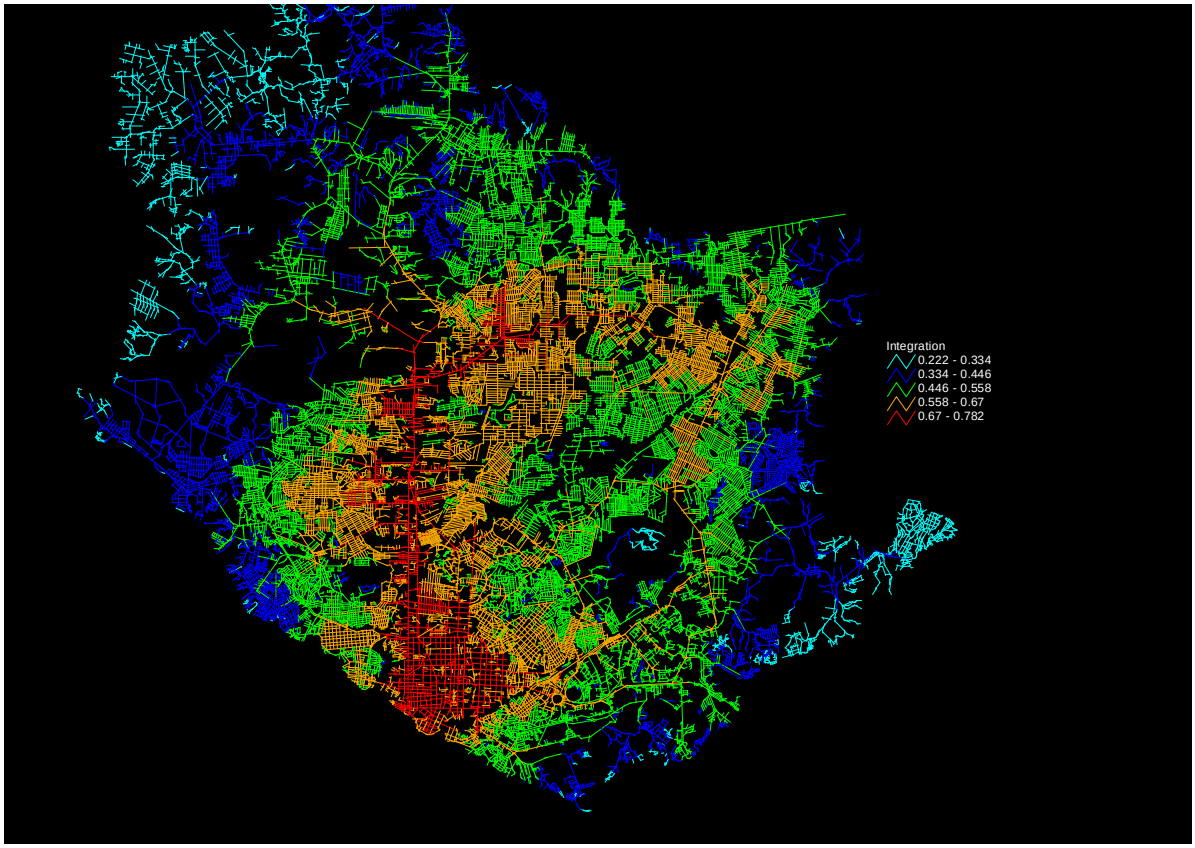


Figure 9 - Manaus: axial map.

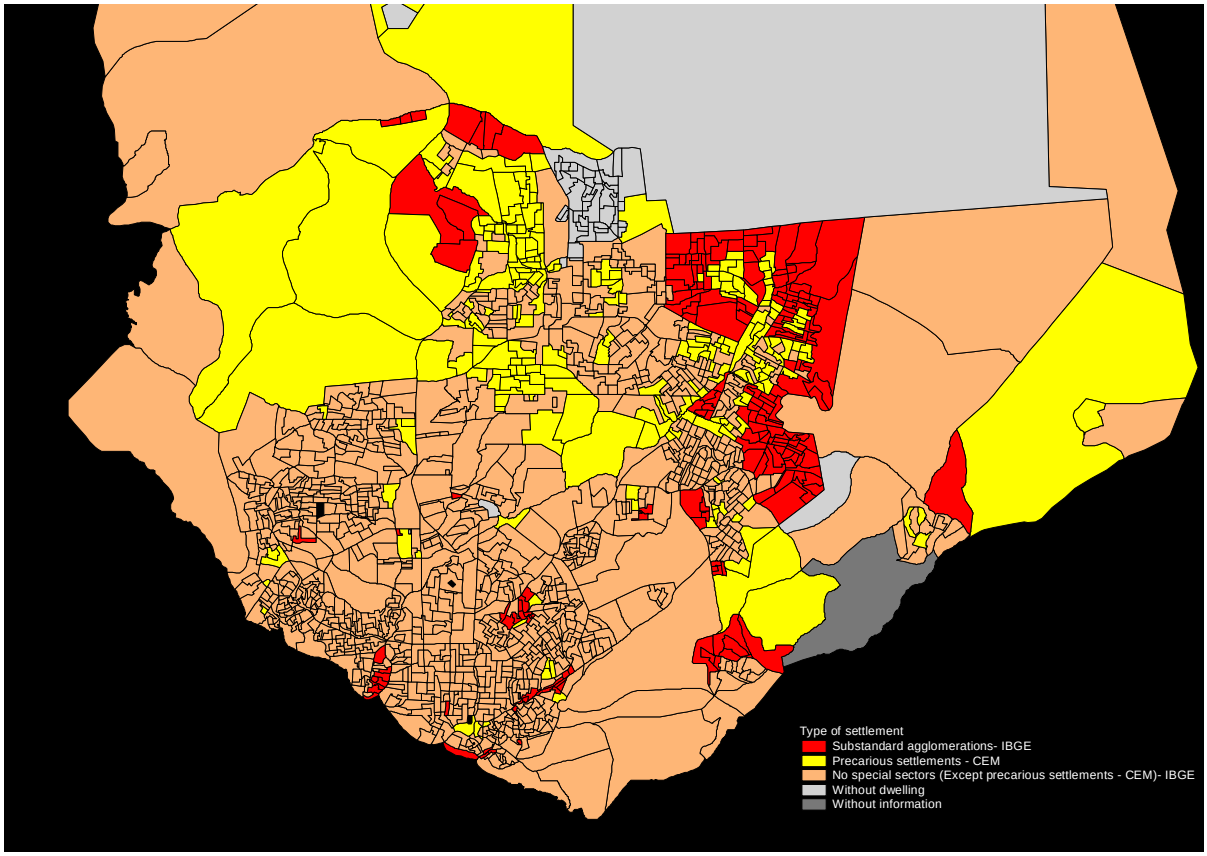


Figure 10 - Manaus: type of settlement.

In Recife, the active urban center (Figure 12) is located in the center north part of the city, coinciding with Graça neighborhood, that concentrates the high income households (above 20 minimum wages – see Figure 11). The Boa Viagem neighborhood is a hotspot of voluntary spatial segregation, as the income levels are similar to the ones in Graça, the same happening in the south expansion, extending trough the municipality of Jaboatão dos Guararapes (Figure 13).

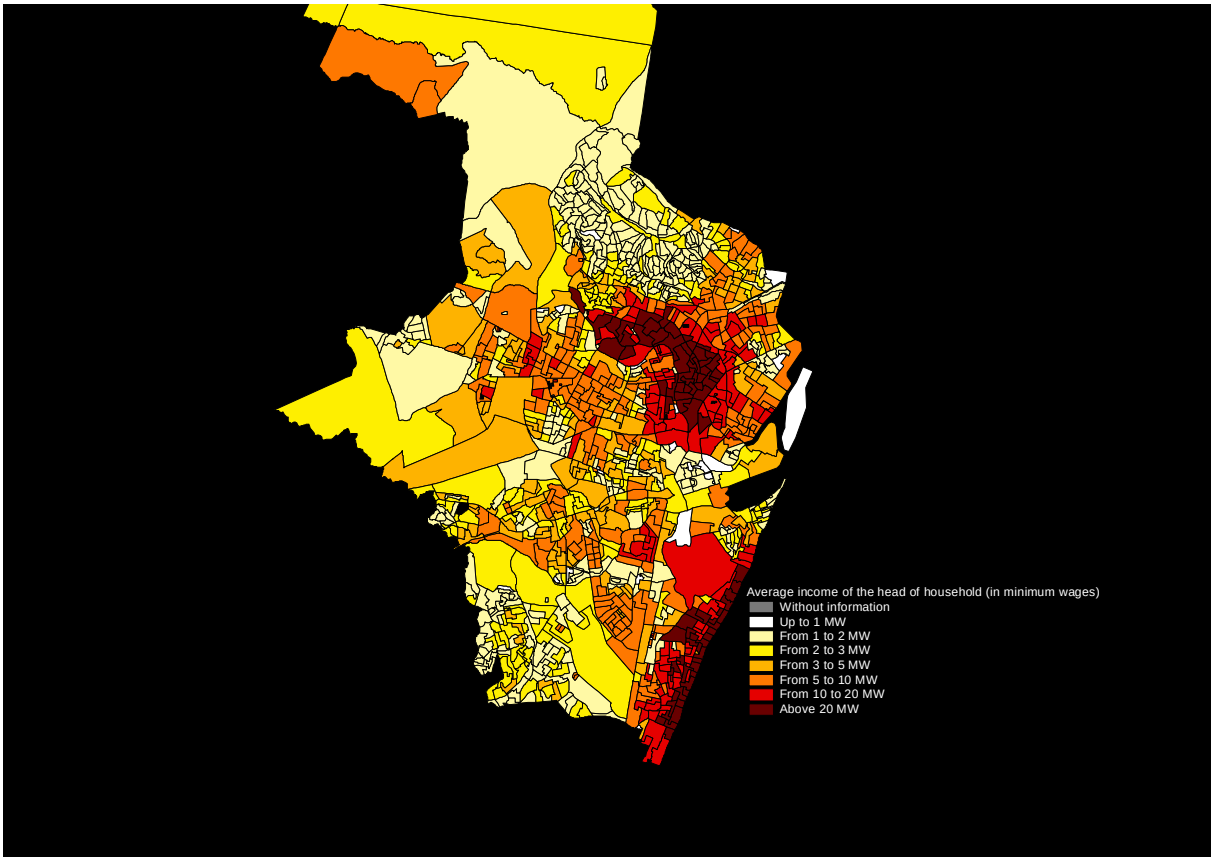


Figure 11 - Recife: average income of the head of household (in minimum wages).

Finally, in the case of São Paulo, the higher income bracket (above 20 minimum wages - Figure 14) is located in the middle east portion of the city, in the neighborhoods of Morumbi, Jardim Paulista, Alto de Pinheiros, Pinheiros, Santo Amaro, Vila Andrade, Moema, all with high road accessibility (Figure 15). In these neighborhoods there are almost no census tracts classified as substandard or precarious, that are common in peripheral areas such as the neighborhoods of Capão Redondo, Pedreira, Jardim Angela, Grajau, São Rafael, Jardim Helena, Itaim Paulista, Lajeado, Cidade Tirandentes, Jaraguá, Brasilândia, among others, characterizing a situation of involuntary segregation (Figure 16).

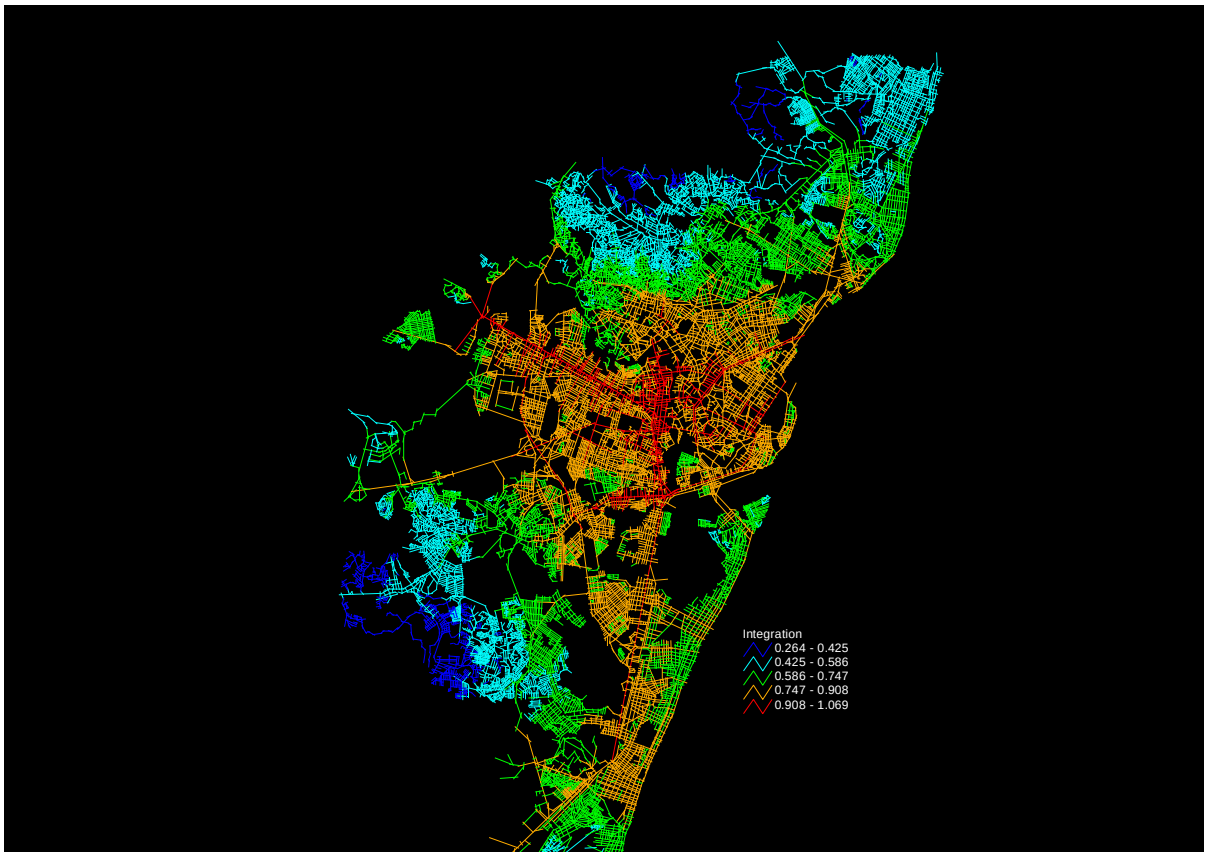


Figure 12 - Recife: axial map.

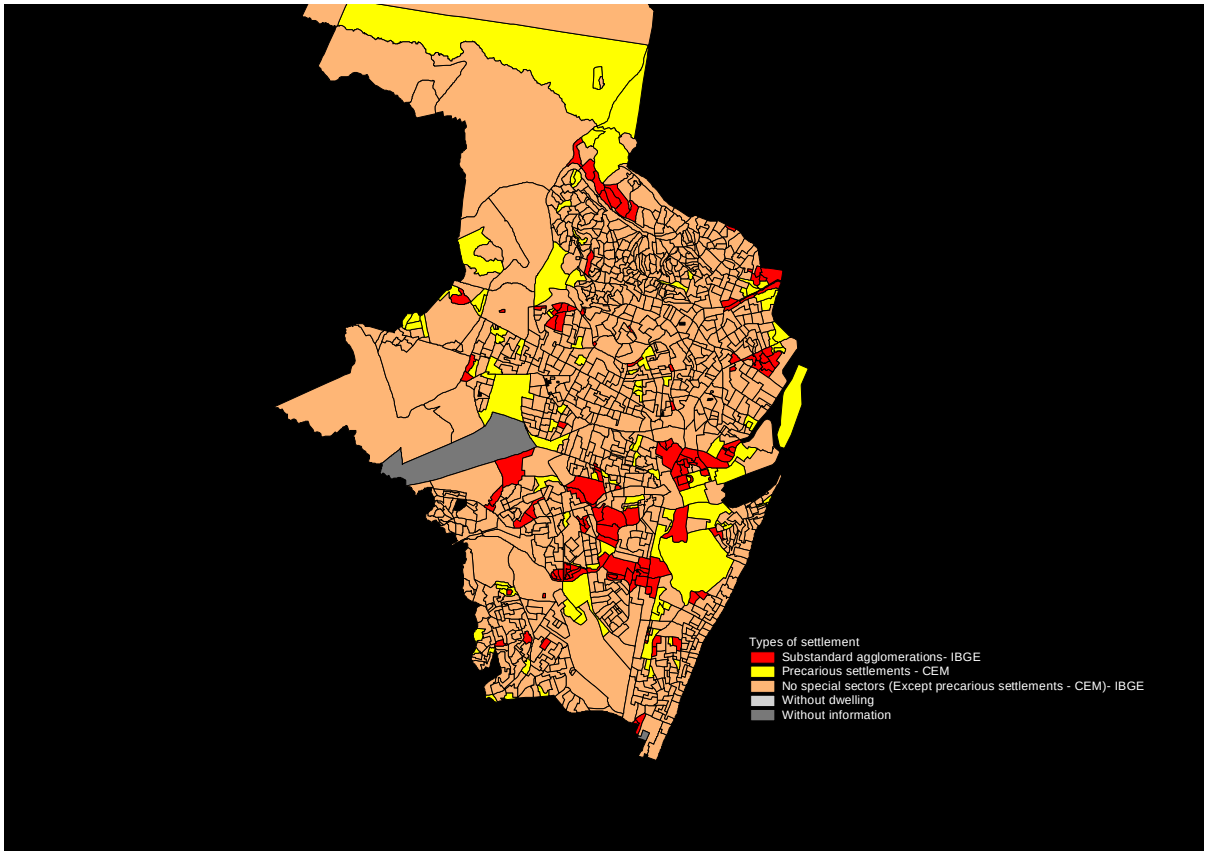


Figure 13 - Recife: type of settlement.

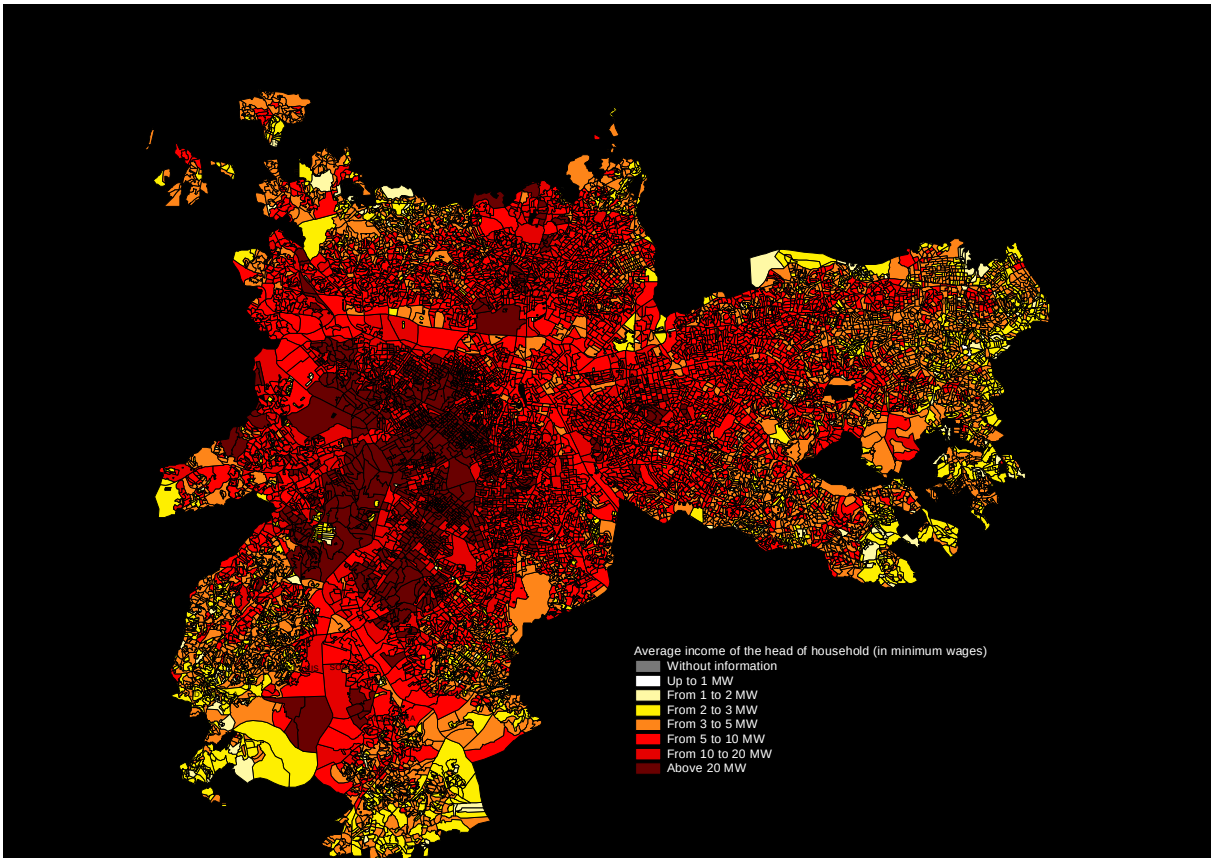


Figure 14 - São Paulo: average income of the head of household (in minimum wages).

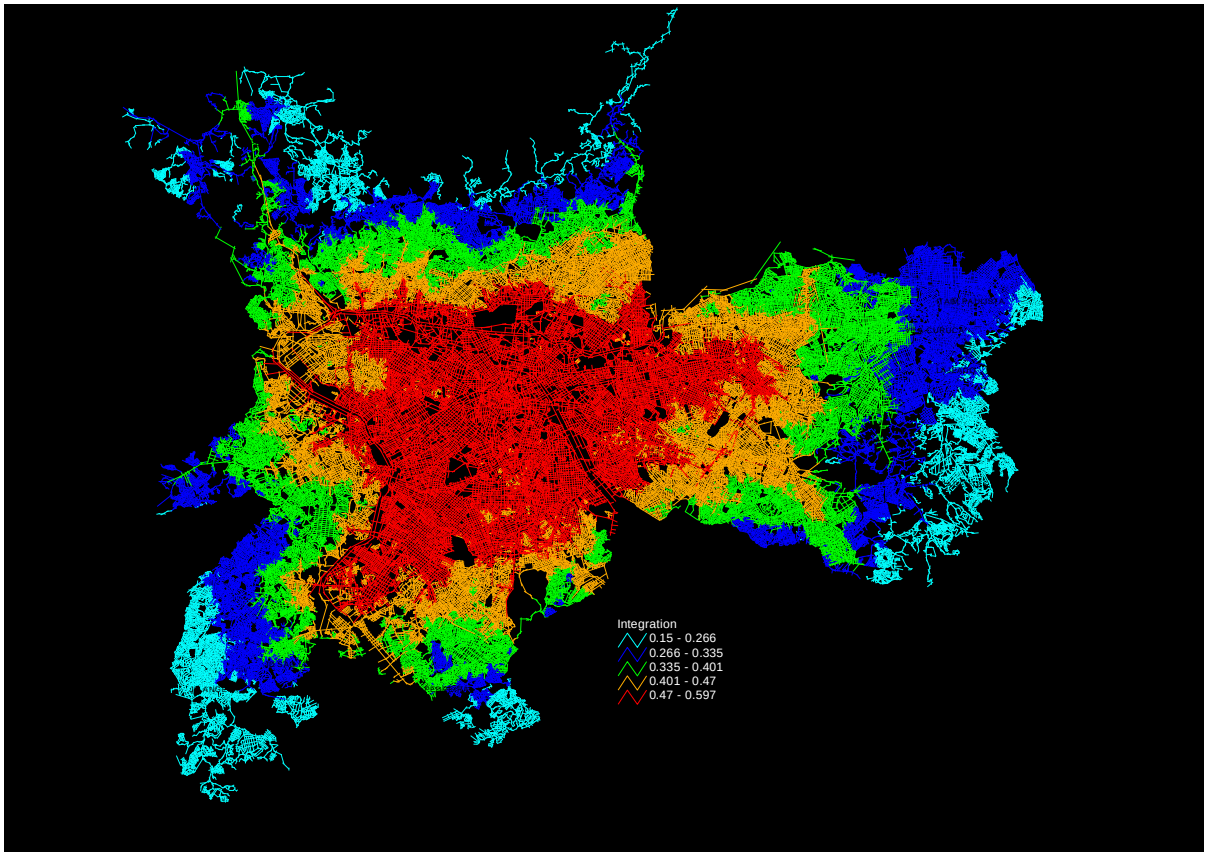


Figure 15 - São Paulo: axial map.

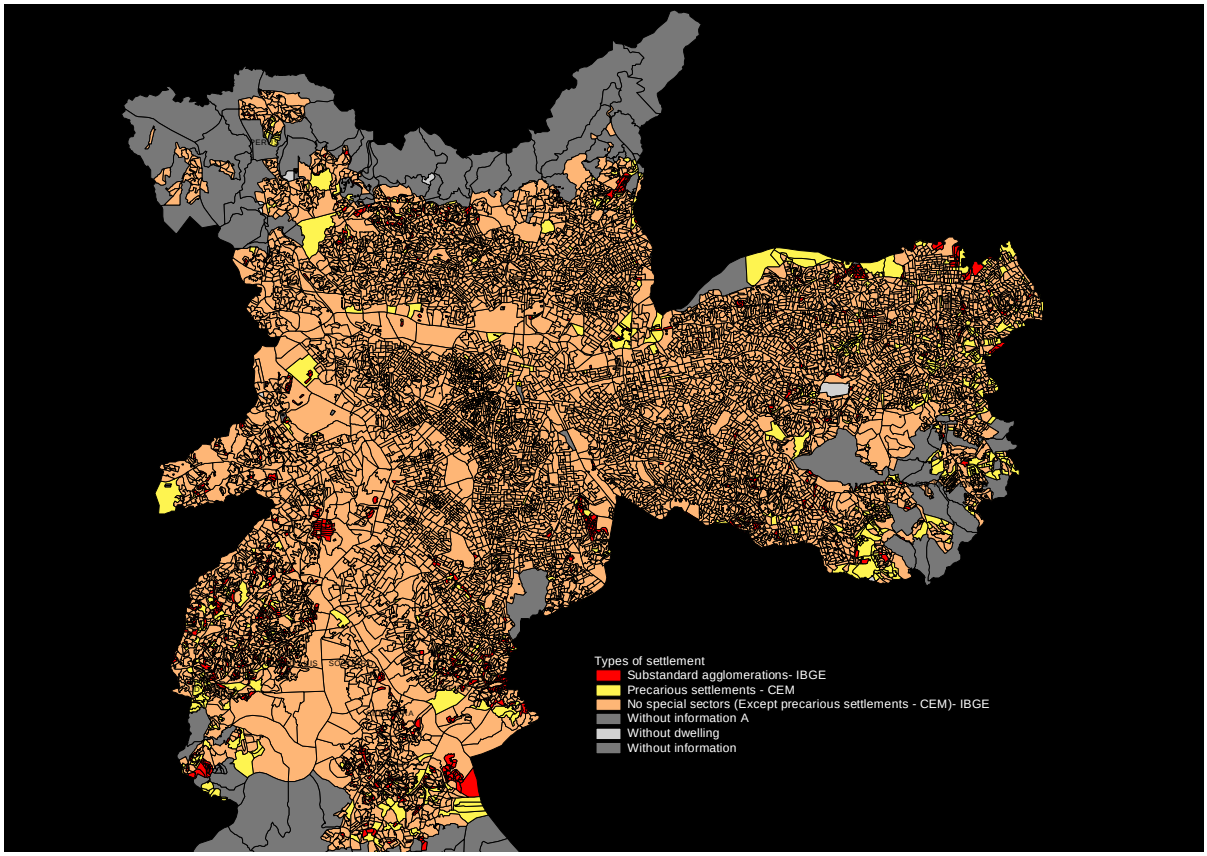


Figure 16 - São Paulo: type of settlements.

In São Paulo, if we analyze the values of integration by districts, we find that those with higher purchasing power correspond to the more accessible areas, as may be observed in Pinheiros (0.500) and Vila Mariana (0.504). The opposite situation is also true: Cidade Tiradentes presents the lowest integration value in the city, with only 0.213 (Figure 17).

An experiment to compare the performance of some neighborhoods located at the same distance from the Se/República region (8.5 km) reveals the continuity of such trend (Figures 18 and 19): the highest the purchasing power, the higher the integration value (Mandaqui: 0.338; Tucuruvi: 0.404; Freguesia do Ó: 0.410; Butantã: 0.432; Morumbi: 0.438; Alto de Pinheiros: 0.466; Itaimbibi; 0.509). From what we can see, the accessibility to the urban space, resulting from its configuration, tends to be a good indicator of income concentration, once accessibility is also converted in an economic good: more permeable areas, in thesis, are those with greater mobility, and, usually, with the highest market value.

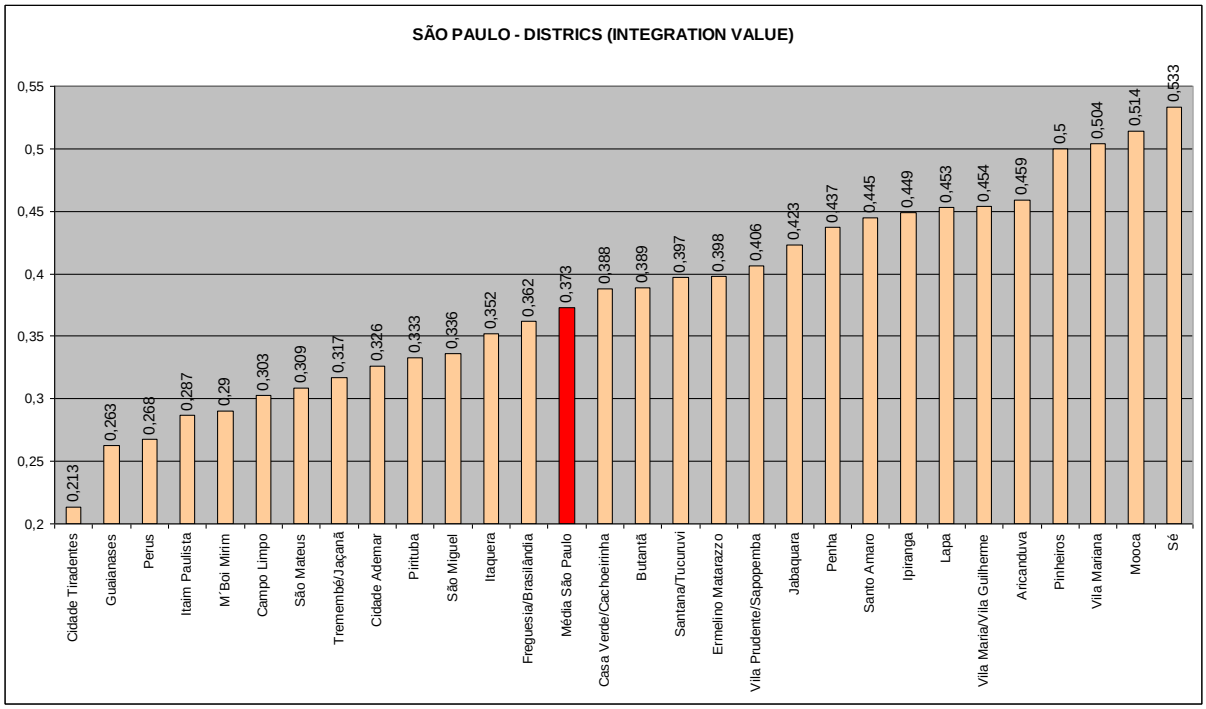


Figure 17 - São Paulo: road accessibility value of integration by district.

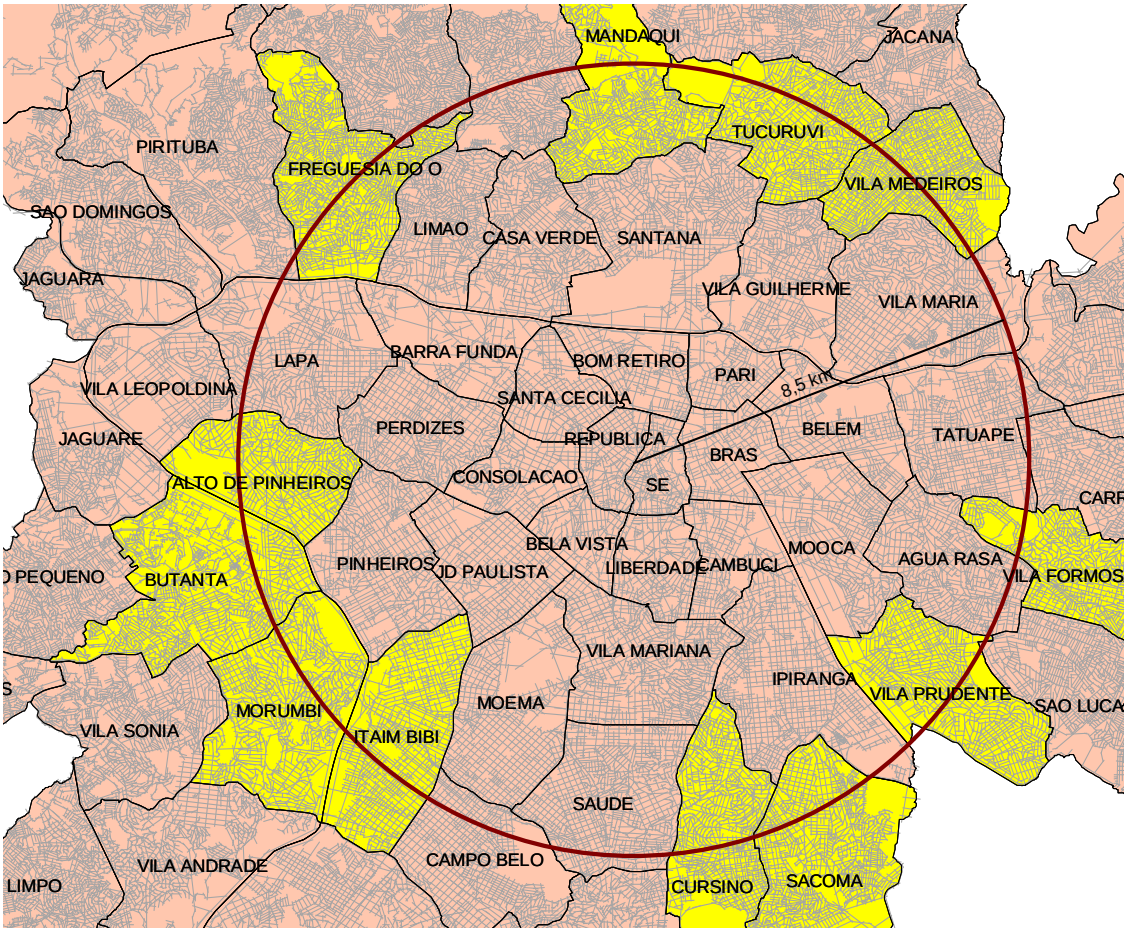


Figure 18 - São Paulo: selected neighborhoods for analysis.

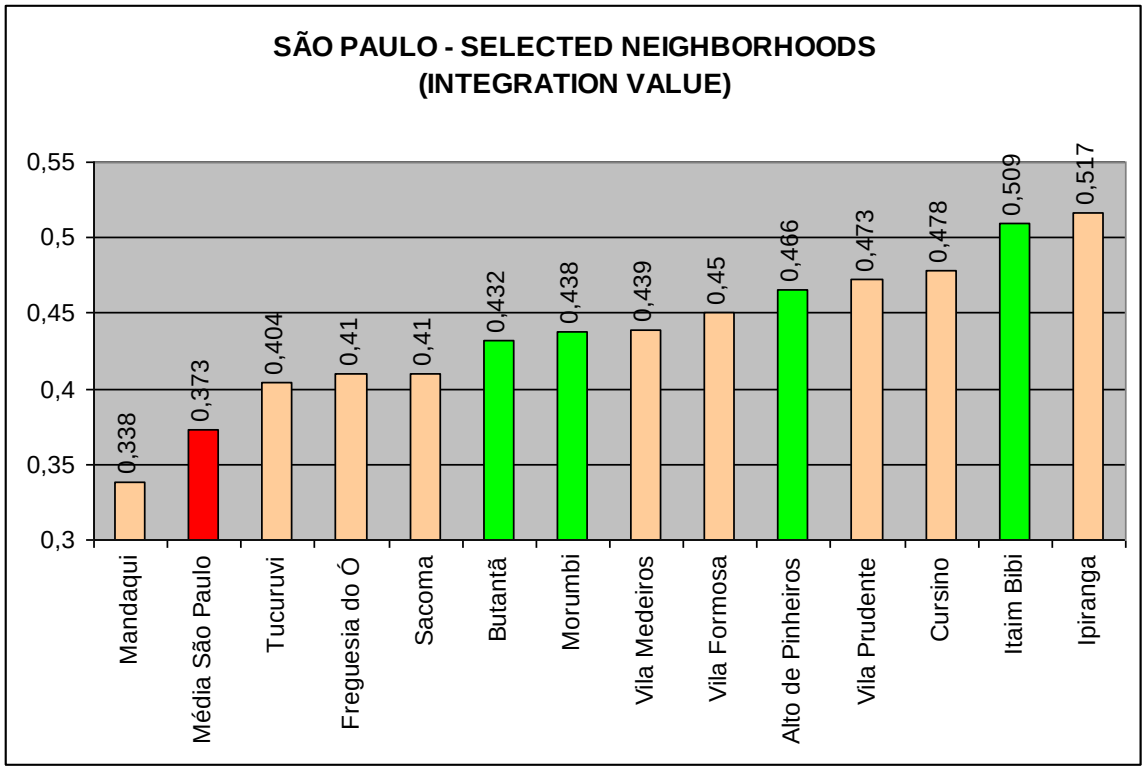


Figure 19 - São Paulo: average integration by selected neighborhoods.

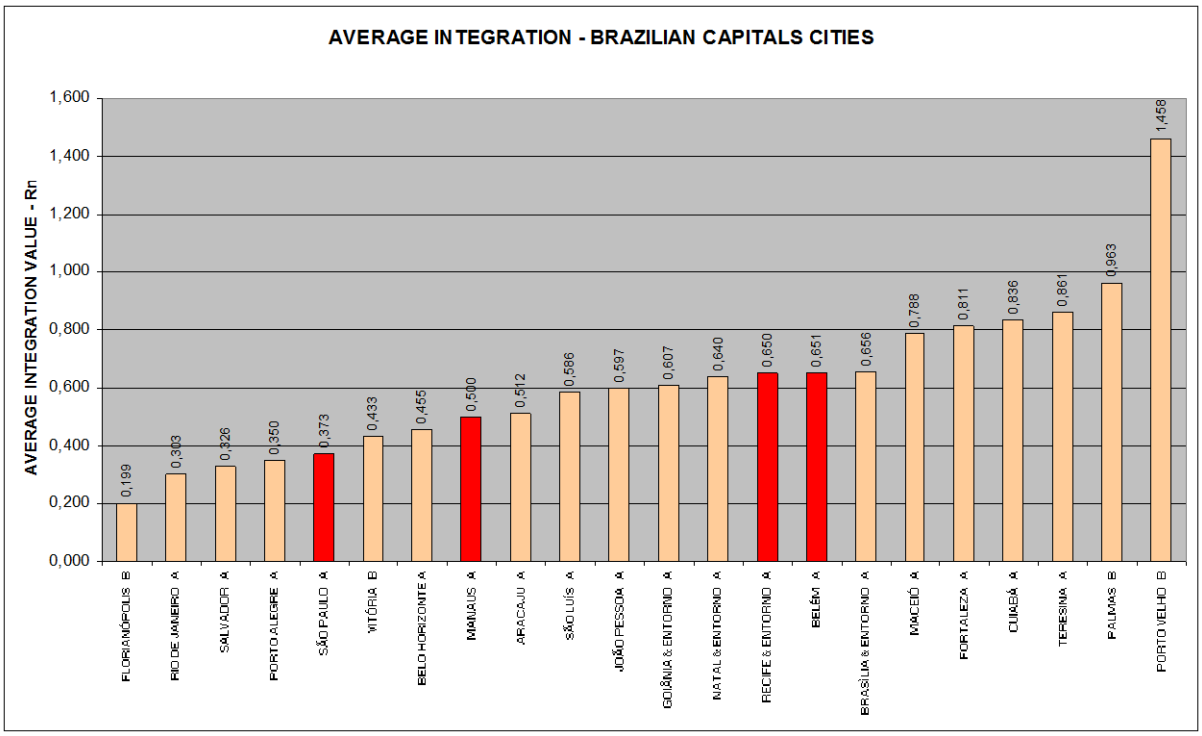


Figure 20 - average integration values of the studied cities, comparing to other Brazilian state capitals. (Source: MEDEIROS, 2006).

Finally, for the last variable - average road accessibility or integration - we have verified that, among the cities studied, São Paulo is the one that possesses an urban grid with less road

accessibility (0.373 - Figure 20). According to MEDEIROS (2006), this value results from a labyrinthine urban form, with strong irregularity and discontinuity of its road axis (Figure 15). Belém, on the other hand, presents the highest road accessibility index (0.651), resulting from an urban grid where roads are more straighter and there is a strong continuity among the axis, producing a less labyrinthine pattern and therefore, more permeable system (Figure 6). Recife´s accessibility index is very close to Belém´s (0.650), showing a good integration of the system with the entire city, what is the result of a more continuous and regular road network (Figure 12). Manaus, on its turn, presents a medium integration value, among the 4 cities, indicating the existence of a road network sometimes continuous sometimes fragmented, a product of a physical space with high incidence of small watercourses called "igarapés" (Figure 9).

CONCLUSIONS

From our results, specifically obtained from the Brazilian sample, we can observe that the spatial urban structure, revealed in its configurational aspects, seems to contribute for a clearer understanding of the phenomena of spatial segregation in the cities of Brazil.

Historically the cities have been treated in the literature according to the distinct degrees of geometry in its road network (KOSTOF, 1992, 2001; TEIXEIRA, 2000; MORRIS, 2001; REIS FILHO, 2001), usually classified between the extremes of irregularity (organic patterns, with design of complex geometry) or regularity (planned patterns, whose resulting structure is based mainly in grids, linear models or radial schemes).

Apart from the discussion of the layout of the cities and of the social expectations that have promoted the consolidation of one of the 2 patterns of road network, it is interesting to understand in what way such patterns - taking from a relational point of view, that is, in the relation of interdependence between all the component parts of the system - affect the urban accessibility in cities, according to the distinct composition of its spatial structure. It means to observe how the layout of the components of the circulation system (patterns of the circulation structures related to road design, forms of connections, existence of nodes, the size of the links, the high or low density of the roads, etc.) interferes in mobility, resulting in restrictions or enabling conditions for road accessibility. It has a direct impact on the aspects of the spatial segregation of social classes in space, as confirmed by our results, where the low income populations or the residents of precarious settlements have lower levels of urban mobility and, therefore, less access to the entire urban system, which represents a deny in their human right to the city.

We conclude, then, that the configurational approach verified by the use of axial maps, contributed to the study of spatial segregation and urban mobility in the 4 cities studied, showing that the configuration of the road network is a relevant aspect to explain some of the urban problems related to social apartheid/inclusion and physical segregation /accessibility in the Brazilian cities. It happens that the spatial hierarchy depends directly on the modes of relationship among the different components of the circulation system, in their various

degrees of regularity or irregularity regarding its spatial structure, which tends to be one of the most robust expressions of the distribution of social classes in the city.

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