

SOCIO-SPATIAL IMPACTS OF INFRASTRUCTURE MEGAPROJECTS IN BRAZILIAN METROPOLES

IMPACTOS SOCIOESPACIAIS DE GRANDES PROJETOS URBANOS DE INFRAESTRUTURA NAS METRÓPOLES BRASILEIRAS

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Abstract

Cities have been increasingly planned and built by private agents, rather than by the State. Scholars understand this as a process often called “market-oriented” urban planning. However, the issue of market-oriented production of infrastructure megaprojects in Brazil has not been fully addressed yet. This paper aims such an issue by proceeding with a well-established method to understand the socio-spatial impacts of *Guarulhos International Airport*, in the Sao Paulo metropolitan area. This method was specifically designed to study megaprojects within the Brazilian urban space regulatory framework. Throughout two broad dimensions, **Spatial** and **Management**, we investigate the occurrence of ruptures in urban dynamics and morphology that may have been caused by private management of the airport. Our findings suggest that both spatial ruptures and management ruptures occurred following the private administration of the airport complex in 2012. Our discussions focus on the hypothesis that market-oriented megaprojects aggravate the issue of splintering urbanism, especially when supermodern infrastructure built by global companies contrasts against chronically unequal urban landscape. This leads to the conclusion that the lack of Federal urbanistic regulation for the private market to design and manage infrastructure megaprojects is the main cause of these ruptures.

Keywords: Megaprojects, infrastructure, airports, Brazilian metropolises, São Paulo.

Research line: 2: City and Project

Topic: Metropolitan and territorial studies

Introduction¹

The paradigm of urban space administration has been changing under neoliberal politics since the 1980s. In the new paradigm, the city is primarily and majorly planned, designed, and built by private agents. This contrasts with State-centered urban planning, common back when Western cities were rebuilding from WWI. Scholars in the field of Urban Planning and Urban Geography understand this process as a shift to a model described as market-oriented urban planning (Harvey, 2005; 2005b; 2012; De Mattos, 2007; Little, 2011; Sanfelici & Halbert, 2018; Wright, 2013).

However, the issue of market-oriented production of infrastructure megaprojects in Brazil has not been fully addressed yet. It is an open question whether this shift has improved urban dynamics in the largest Brazilian metropolises, or aggravated the issue of “splintering urbanism” (Graham & Marvin, 2001), understood as the fragmentation of the city into smaller segregated areas. Infrastructure projects have a large potential to splinter urban space because, as the authors point, “one person’s infrastructure is another’s difficulty” (p. 11). To address this issue, we will build upon existing theories for megaproject analysis in Latin America, especially in Brazil, analyzing the case of Guarulhos International Airport (GRU) as an empirical object of study (Figure 1).



Fig. 1 Brazil, state of São Paulo, and the city of Guarulhos highlighting the airport site. Source: Author (2020).

Scholars specialized in the relation between airports and their cities argue that, although airports have been comprehensively planned from the standpoint of more efficient passengers processing and international aviation standards, not enough attention has been given to how airports relate to the urban space surrounding them (Freestone & Baker, 2011). Our hypothesis is that when airports are planned and managed by private agents, rather than by the State, these issues can be aggravated, given the fact that these agents will pursue the success of their enterprises rather than the success of the entire city as an object of integrated planning policies.

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Since 2012, the most important infrastructure megaprojects for civil aviation have been held by the private market in Brazil. At this moment (July, 2020), 22 Federal airports, the majority of them located in metropolitan areas, are managed by the private sector. The case of GRU is emblematic and representative of this shift for two main reasons: It is the largest airport in South America by passenger traffic, and it has recently experienced a series of territory management impasses in connecting to other transportation modes within the metropolitan area of Sao Paulo. Our research suggests these impasses can be attributed to the lack of articulation between the operation of the terminal by the private agents and urban planning policies on municipal and metropolitan jurisdictions.

We will begin our article by defying **megaprojects** according to scholars from The United States, Latin America, and Brazil. These definitions are important because the widespread notion of megaprojects focused on their cost is understood not to be the most suitable to discuss Brazilian cases. Instead, we focus on a definition from a **socio-spatial perspective**. The most important academic reference for this study is the theory that understands megaprojects as **those that cause ruptures in urban dynamics** (Vainer et al., 2012) resulting in what Graham & Marvin (2001) define as “splintering urbanism”. In this sense, the ruptures are understood as a breach, or a disturb, to a socio-spatial situation.

After establishing a panorama of megaproject definitions, the one adopted will be the base to uptake the method through which we analyze such projects. After that, the method will be applied to the case of GRU, where those management impasses will be explored and discussed to establish what ruptures were found on the urban dynamics of the Sao Paulo metropolitan area. To conclude, our research will suggest that the lack of Federal regulation for the private market to design and manage infrastructure megaprojects is the main cause of these ruptures.

1. Defining megaprojects

Although much has been said about megaprojects and their impacts, there is no consensus in the field regarding the origin of these large urban interventions. Some scholars argue the most paradigmatic case is the remodeling of Barcelona for the 1992 Olympics, some argue it is La Défense, in Paris, or Battery Park, in Baltimore, (Vainer et al. 2012). Others look further back and mention Haussmann’s Paris interventions in the XIX century as the beginning of urban megaprojects (Harvey, 2012; Oliveira, 2013; Ultramari & Ciffoni, 2014). However, knowing the origin of megaprojects is not as relevant as discussing their **current definition** and impacts. Hence the effort made on this work to set an understanding of what makes a project to be considered “mega”, and to establish a methodology to specifically analyze **infrastructure megaprojects**.

It is important to investigate how the definition of megaprojects can have nuances for different scholars in different global contexts. Therefore, it is compelling to contrast such authors and identify similarities and contradictions among their work. Since this paper is intended as a dialogue with these scholars, we will briefly revise the concept of megaprojects in three geographical scales: The United States, Latin America, and Brazil.

North American scholars Altshuler & Luberoff (2003) have published one of the most cited works on this topic, titled *Mega-projects: The changing politics of urban public investment*. On their work, they explore such projects since the 1970s when, as they argue, a new generation of these projects has begun. They define megaprojects as those that cost more than 250 million dollars (in values of 2003). This criterion is arguably not the most appropriated to consider a project to be “mega”. Mainly because the cost can be related more to land value and materials or techniques used in construction than to the role of the project itself in a broader urban context. Although we undermine the authors' cost-based definition of megaprojects, their work sets an advanced understanding of how the State, represented by interjurisdictional power, and private agents articulate ambiguously on planning and building megaprojects.

Within Latin America (LA), Lungo & Smolka (2005) argue that megaprojects have emerged since the 1970s as an instrument to exclude social participation for the process of city-making. Mostly because these projects tend to be planned in a centralized and oftentimes authoritarian manner. The most recognized Latin America scholars researching this topic focus on (1) understanding how these projects impact on land value, (2) how they change functional characteristics of specific metropolitan areas, and (3) how they change mechanisms of public management of the urban space (Cuenya, 2006; 2011; Cuenya & Corral, 2011; Jajamovich, 2018). As we will see further in this paper, the points focused by this group of authors from LA are accounted for in the framework proposed by local Brazilian researchers to analyze megaprojects.

Among Brazilian scholars doing research on megaprojects, Vainer et al. (2012) have proposed a methodology to analyze them by accounting for the peculiarities of our urban history characterized by chronic class segregation, and fragmentation of metropolitan functions. Along with other scholars' understanding (Novais et al., 2007; Moura, 2011; Gadens et al., 2012; Freitas, 2016), their definition of megaprojects accounts for **those with expressive potential to cause ruptures in the physical and social space of the city**. Upon this definition, Vainer et al. argue that, to understand the complexities involved in megaproject decision-making, construction and operation, they have to be analyzed under a series of aspects and criteria. The authors also acknowledge this series might change from one project to another due to available data and particularities of each project. They list seven central aspects that should be used to design an analysis script, suggesting these aspects can be fractioned or merged according to each case: (1) architectonic-urbanistic aspects, (2) real estate aspects, (3) social and environmental aspects, (4) political aspects, (5) institutional aspects, (6) symbolic aspects, and (7) economic and financial aspects.

This method has been applied to understand several megaprojects in Brazil, such as *Minas Gerais* State Government Headquarters (Faria, 2012), and one of *Petrobras* oil refineries in Rio de Janeiro (Amaral et al., 2012). Both studies are similar in scale and interjurisdictional planning to the case study proposed here. Likewise, these projects are positioned similarly in space and time. They are located in the Southeast of Brazil, its most developed region, and were built after a period of expressive economic growth which peaked in 2010. Although Guarulhos Airport exists since the 1980s, it was only in 2012 that it began to be managed by the private sector and was significantly expanded and modernized according to international parameters of operation, passenger comfort, and technology for airports in global cities.

In light of the aforementioned, we understand this **multi-aspect method** to be the most suitable to analyze Guarulhos Airport as well. Mostly because it was conceived to study projects inserted in similar space and time, which combine public and private investments, and are related to infrastructure provision. To establish a conversation with these authors, we will adopt their concept of "ruptures" to define abrupt changes in the *modus operandi* of megaprojects and their impacts on the urban space and local communities. In the next session, the methodology is explained in detail, including our proposal for merging those seven aspects into two broader aspects that also account for the main topics focused by other LA researches previously mentioned.

2. Defining the method to analyze megaprojects

In this session, we describe the framework which guided the analysis of this specific infrastructure megaproject. Scholars argue that the complexity of these large and expensive projects requires the analysis to be done from multiple points of view (Vainer et al., 2012). These points of view, or aspects of analysis, as we have been calling them on this paper, were thought to take into account the context of megaprojects construction in Brazil, also considering the research done on this topic since 2007 (Novais et al., 2007).

The method was formally proposed by Vainer et al. in *Notas metodológicas sobre a análise de grandes projetos metropolitanos*, in 2012. It consists of processing all data available about a specific megaproject across aspects of analysis. Each aspect is composed of a set of indicators that, together, outline the multi-aspect analysis, which is the core of this foundational method.

Systematically, all of the authors cited in this work analyze megaprojects with a similar method. They argue that the physical and financial complexity of these projects disbands the *modus operandi* of the city causing ruptures on urban form and dynamics. Considering this broader view, we have merged the seven aspects of analysis earlier mentioned into two broader aspects: (1) The **Spatial** aspect will discuss morphological issues, while (2) the **Management** aspect will discuss bureaucratic and symbolic issues.

The data used on this research comes from: (1) official documents concerning the project contracting and execution, (2) urban codes of Guarulhos city and Sao Paulo metropolitan area, (3) the institutional structure of the consortium managing the airport, (4) *BNDES*, the national bank financing most of the project, (4) interviews with agents from the Federal Government involved with the projects and agents from the state of Sao Paulo involved in the decision-making process, (5) information obtained with the press speaker representing the private agents involved, and (6) information from nationally accredited news outlets.

A summary of this framework is displayed in Figure 2. In the first box, the two aspects of analysis are linked to their corresponding aspects in Vainer et al. (2012). In the second box, the procedures of analysis are linked to the main sources of information used. In the third box, the results come in the form of ruptures that have been identified in the urban context.

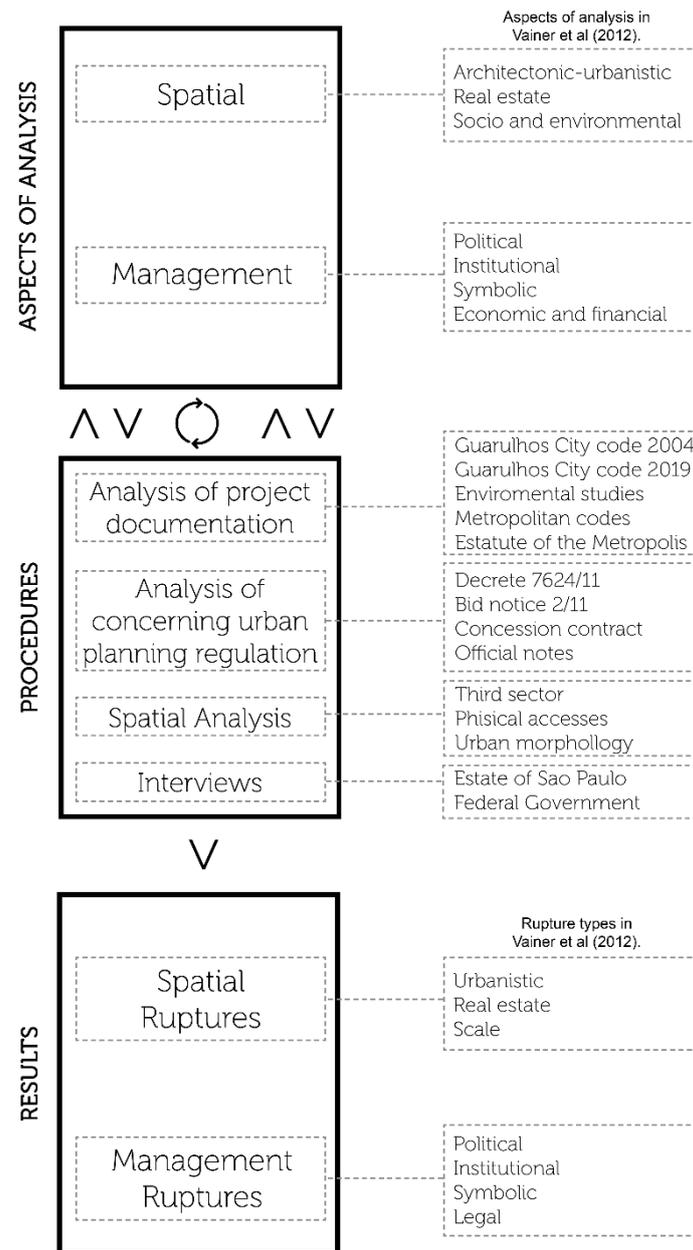


Fig. 2 Method framework. Source: Author (2020).

To understand this project and what ruptures it has caused, we used indicators (Table 1) suggested by the literature (Vainer et al., 2012; Cuenya, 2011; Tonucci Filho & Freitas, 2020), and grouped under these two aspects of analysis: Spatial and Management.

Ultimately, all of the information was gathered from the multiple sources earlier listed. A thorough analysis of the project contract and legal regulation was the first step taken in order to understand what information we were looking for and to what end. These documents suggested which public or private agents should be investigated, and what pieces of information we were looking for in order to study the indicators listed below.

Table 1 – Indicators of analysis.

Aspects of Analysis	Indicators
Spatial	A- Reconfiguration of the area to upscale services
	B- Surrounding infrastructure projects
	C- The relation between the megaproject and its surrounding
	D- The relation between the megaproject and metropolitan planning
	E- Land use and occupation
	F- Real estate dynamics
	G- Real estate price variation
	H- Environment impacts and urban development
	I- Compulsory displacement of communities
Management	J- Local political coalitions
	K- Changes in institutional agents
	L- <i>Ad hoc</i> legislation
	M- Changes to urban codes and laws
	N- Motivation to publicly justify the project
	O- Project funding
	P- Economic exploration of the project
	Q- Distribution of costs, benefits, and risks

Table 1 Indicators of analysis. Source: Author (2019).

3. Results

Upon analyzing each of the indicators, we were able to determine that both **Spatial ruptures** and **Management ruptures** might have been caused by the change from public to private administration of *Guarulhos International Airport*.

Spatial ruptures can be categorized in two moments of the history of the airport. First, when it was initially built in the 1980s, by becoming a threshold between neighborhoods of Guarulhos. This could be associated to Lynch's concept of "edges", understood as "linear breaks in continuity" that can act as barriers in the urban space (1960, p. 46). In the case of highly secured places such as airports, these barriers are not at all penetrable. The second point of rupture was when the airport became a private asset. It then grew around

30% in number of passengers from 2012 to 2019. During this period, it had a series of additions and modernizations made to the complex, which highlight the contrast between its buildings and services designed for global citizens and its surrounding landscape of low-income residents lacking all sorts of urban services and infrastructure in their neighborhoods.

The new international terminal (T3, Figure 3) is the most significant of the changes in the urban landscape of Guarulhos. It was built by the private consortium in 2014, and it is marked by its contemporary architecture and automated systems for boarding and immigration. Additionally, the terminal is equipped to handle “Code F” aircrafts, the largest in circulation.

On the access road to the airport, messages in multiple languages directed to passengers create a simulacrum of a global city which contrasts against the landscape of slums and poor infrastructure in adjacent neighborhoods. Our observations showed that all neighborhoods surrounding the airport complex present some kind of lack of urban services, such as decent and secure housing, paved streets and sidewalks or proper collection of trash (Figure 4).

Although the airport complex has been made denser of modern buildings and new uses, changes in real estate dynamics of the surround areas could not be identified by this research. We are not suggesting they do not exist, though we could not verify changes in land property around the megaproject because we did not obtain enough data from the city planning department that would allow us to investigate such process. This presents a research gap that could be better understood through another research, this time focused in local land registry offices with open data that could allow inferences on changes in real estate dynamics occurred or reinforced by private megaproject management.



Fig. 3 Urbanistic ruptures: International Terminal facade (upper) and Nova Vitória occupation of an empty surrounding site (lower). Images source: GRU Airport (upper) & Mídia Ninja (lower).

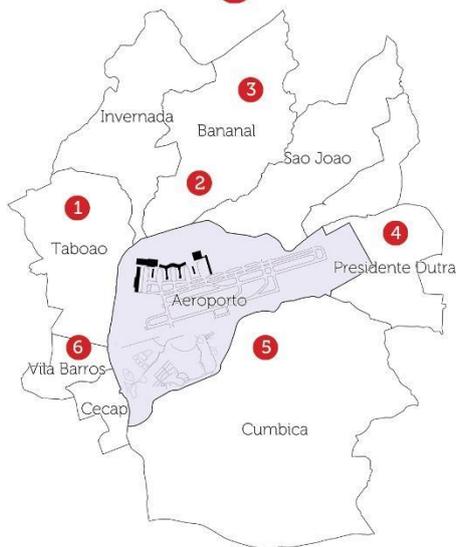
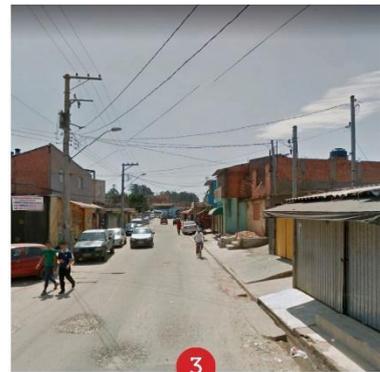


Fig. 4 Surrounding neighborhoods lacking basic infrastructure. Map base: City of Guarulhos. Street images: Google Street View. Collage: Author (2019).

Management ruptures are mostly suggested by the change in the administrative agents behind airport operation. Before 2012, the Federal Government was the only entity managing airports through its enterprise *Infraero*. After the concession policy has been adopted, upon a study presented by McKinsey & Company (2010) to the Federal Government, several private agents have started business across Brazilian airports. In Guarulhos, a national infrastructure management company, *Invepar*, formed majorly by pension funds of other State-owned enterprises, is associated to *Airports Company South-Africa* during the *concessa venia* period, contracted for 20 years (2012-2022).

The turn to private airport management brought new impasses to urban planning. For instance, when the state of Sao Paulo was finally delivering the so-promised train connecting the airport to downtown Sao Paulo, the consortium managing *GRU Airport* did not give permission for the state to actually finish the train line inside “their” property. The train ended up stopping three kilometers away from the international terminal. The federal government not only did not stop such impasse, as it actually ended paying for the issue in the form of a “discount” of 175 million Brazilian reais (R\$ 175,000,000.00), which will be spent to build an automated people mover (APM) that will link the airport to the train line, making passengers’ journey longer and infrastructure provision more expensive.

As part of ruptures in the management aspects of the project, we also found *ad hoc* legislation, which can be grouped in two jurisdictional levels: at the city level and at the national level. The first group refers to a new city zoning approved in 2019 which encourages urban revitalization in the neighborhoods near the airport. The main objective is to attract new businesses focused in airport-oriented economy. The second group includes the legal rupture that established this new model of airport management in the whole country. Following the *concessa venia* model adopted in 2012, all federal airports should be managed by private agents by 2022, which reinforces the importance of understanding how private companies are impacting cities when they replace the State in the management of projects of public interest. It is important to note that the coronavirus crisis does not seem to be affecting these plans as of July 2020, since the Ministry of Infrastructure is maintaining its schedule for future concessions. Although, knowing what companies might be interested in these projects, if any, is a different issue, rather difficult to discuss at this time.

Political ruptures were not influenced by the network of agents concerning this project, based on the data we were able to analyze. Actually, our analysis suggests that this project followed the exact same *modus operandi* of other concessions made by the Federal Government during all presidential terms served by the *Workers Party* (PT, 2002-2016).

New social relations between local and global dynamics were also intensified at the point in 2014 when the airport started being connected to all continents around the globe. The number of flights was considerably increased due to articulation with airlines to supply all of the demand created by the 2014 World Cup and the 2016 Olympics. All of the new routes intensified the role of the city in the network of global cities and reinforced the role of *Guarulhos International Airport* as the most important airport in South America. Additionally, the rise of the middle class, consolidated in the 2010s in Brazil, when more citizens adopted air travel to circulate through this continentally-sized country played a role in increasing demand for air travel.

4. Discussions and final notes

The purpose of this investigation was to test the hypothesis that megaprojects cause ruptures in the urban space by aggravating the process of splintering urbanism (Graham & Marvin, 2001; Vainer et al., 2012). Our results allowed us to infer that the bureaucratic framework which guides the consortium that manages *Guarulhos Airport* does not account for previously approved guidelines of urban and metropolitan planning.

As the **Management** aspect of analysis suggested, these impasses in **Spatial** management can be attributed to the lack of articulation between the operation of the terminal by the private agents and urban planning policies on municipal and metropolitan jurisdictions. While these two lower levels seem to not have the practical power to stop private agents' actions that go against public need or awareness, the Federal government, which claims to have control (and veto power) over these projects, does not seem to take action when impasses arise.

As it has been pointed by Freestone & Baker, it is necessary to seek "greater convergence between airport and city planning" to avoid such issues in the metropolitan scale (2011, p. 274). If aviation is so important to the network of global cities, then the cities must have aviation infrastructure built explicitly into the urban transportation system, integrated to other forms of transportation and with attention to the impacts infrastructure causes to local dwellers. The authors also argue that airport governance has to be shared among airport operators and public authorities, because airports are not actually a unique structure, but rather part of the city and its dynamics. Such argument comes down to a whole different level of importance when we discuss an airport that is inserted in the middle of fragile neighborhoods lacking all sorts of urban infrastructure, as is the case of *Guarulhos International*.

An evident limitation of this study is that it analyses one megaproject only, although it allows us to hypothesize the results would be similar for other projects equally regulated in other metropolises under the same regulatory framework. Ideally, this study would have included systematized interviews with public authorities and CEOs of the companies involved in the administration of the project. However, our approaches to discuss the project and its implications were treated with skepticism and our requests for interviews did not advance. Other limitation is the fact that the City of Guarulhos does not have – or at least did not provide – enough information that would allow us to understand what types of land use are there around the airport, who owns these properties, and what kind of businesses permits have been issued recently.

Nevertheless, this research and its discussions advance the field of infrastructure megaprojects research within the Brazilian contexts. Potentially, this study could be taken into account when designing the contract for future airports to be transferred to the private management model in Brazilian Metropolises.

Additionally, this study deepens our understanding of megaprojects urban impacts and provides input for cities that contain such projects in their territories. Our findings outlined issues that could happen when these cities adopt such policies of private management without enough regulation at the local level. Ideally, the framework we used here to analyze GRU could be used to analyze other projects of this genre in Brazil and possibly in Latin America, for future comparative studies.

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