Extended Abstract


This study presents a discussion of criteria for evaluation in the metropolitan region of the city of Rio de Janeiro and its impacts in order to be reviewed in terms of construction as well as its financial and operational performance. As a way to study, were looked for reference topics and also real enterprises options to compare indicators for development, definition and propose conditions for good performance in this area and scope.

Logistics condos can be defined as storage areas in a consolidated or segregated way, using areas that can be shared with companies or used alone to meet demand or provide gains through their use.

These centers were developed to provide economies for logistics operators, carriers, industries and retailers, meeting their needs for warehousing, distribution, cargo consolidation and vehicles’ distribution. By bringing together several sheds with flexibility to segregate spaces in a unique place with security and shared services infrastructure, where companies enjoy a cost-benefit relationship that they would not be able to achieve alone. In addition, it aims to offer services and provide logistical integration, cost reduction in inventories, facilities and processes, as mentioned by DIAS (2013).

Logistics condos are also considered as evolution of the Distribution Centers (CDs) and are made up of different complexes of warehouses with different sizes and modules, located in condominiums, where costs, infrastructure are shared, as well as expenses with surveillance and security (Sobreira, 2012).

According to DUBKE (2006), a logistics platform is a name given to logistics centers that operate by adding value to the product through a wide variety of services. Another mention is the Integrated Logistics Center (ILC) concept, which brings together a number of functions of transportation, logistics, operational support, and industrial processing. Such ILCs may house intermodal
road and rail terminals and logistics platforms capable of carrying out for example stocking, distribution and consolidation operations. Through this concept, it can be concluded that logistics condominiums can be part of logistics platforms as a whole, mainly because they are sheds for the storage part as mentioned.

However, since the ILC concept is extremely broad in terms of logistics platforms and also a logistics center integrated in the national territory, we opted for the evaluation and concentration of information only for the cases of logistics condominiums and in proximity to the urban center of Rio de Janeiro. Such choice is also due to the port activities that are attractive in this region to have such condominiums.

As a general objective, to define and understand the conditions of good performance for the contemporary market of Logistics Condos, considering Brazil’s scenario with surroundings of large urban centers, focusing specifically in Rio de Janeiro’s state.

Throughout the steps that will have intermediate objectives of this dissertation: to study the history of warehouses and / or Logistics Condos and the cost of implementation over time and its characteristics and constraints; to verify the restrictions and / or the need of implantation due to the expansion of cities, their growth and their potential of economic and social development through the evaluation of indices in the determined aspects;

- to study and evaluate possibilities and actions that are being taken in the area of sustainability, in order to have more sustainable conditions and also to improve the results studied.

This dissertation is subdivided into 5 (five) chapters. Chapter 1 briefly introduces the general scope of this paper, its main objectives and the motivations for elaborating the theme focused on Logistics Condos.

Chapter 2 describes the theoretical grounding, showing all the concepts that underlie the complete development of this research.

Chapter 3 presents the methodology of the work, being the comparative structure between the conditions for evaluation and comparison between Logistics condos and their characteristics evaluated under the social, technical-operational, financial and environmental dimensions.

Chapter 4 presents the case study about the specific Logistics Condos at Pavuna, Rio de Janeiro.
Chapter 5 discusses how completion and opportunities for further developments complement the discussed topic.

Finally, we present the Bibliographical References that supported the elaboration of this study.

Logistics is a segment that involves high complexity segments and the cost reduction, as well as the agility, the rendered services improvement, and its greater flexibility. The best solution found for managing all the situations and tasks required for the sector to function efficiently was outsourcing, mainly in relation to the hiring of Logistics Service Providers, according to NOVAES, 2001. As a result, it grew Interests of foreign companies in the sector and several international companies have settled in Brazil, bringing with them greater professionalism and operational improvements.

The comparison between logistics history, Rodrigues (2013) uses the term paradox, which is explained below, since logistics is, at the same time, one of the oldest economic activities and one of the most modern managerial concepts. Since the man left the extractive economy and started the organized productive activities, with specialized production and exchange of surpluses with other producers, three of the most important logistics functions emerged, namely: stock, storage and transport.

Logistics activities in companies, which at the beginning only covered transportation and warehousing activities, also started to perform activities such as inventory control, packaging, order processing and material handling. The expansion of logistics activities initially allowed the internal integration with other functions of the company, mainly marketing and production. This first stage is known as the evolution of the concept of integrated logistics, and is currently well established in productive organizations (WANKE et al., 2011).

Regarding the complementary activities represented by the reverse logistics, storage and cross docking (the mode in which the products are received in a specific platform, consolidated and immediately sent to the final destination, not remaining in the storage area) are responsible for 50% of the contracted outsourcing services.

The activities considered more sophisticated, that require a higher level of management and complexity occupy 38% in the outsourcing segment. "Although they are the least outsourced, sophisticated activities are those that present the
greatest growth potential for the next few years", according to Barros, 2009. In addition, Barros (2009) recommends that storage needs to be planned, involving warehouse layout, materials handling, packaging, identification, methods of locating materials, cost and service level that wishes to be offered. One of the most relevant aspects should be the detection of the equilibrium between the cost of keeping in stock, related to service level.

These condominiums are located in privileged locations, another reason that arouses the interest of the companies in the segment, since they avoid the circulation by restricted areas and schedules. In this way, small companies, which could not afford the cost individually, can add efforts and services, guaranteeing profitability. Another factor that arouses interest in these condominiums is that the management is usually done by specialized and dedicated personnel and have the synergy of sharing surveillance and security resources, concierge, among others.

Among the definitions and classification of types of logistics condominiums, we can cite as follows the main names and their specific characteristics according to DIAS, 2013.

Single user: Logistics condo for a unique user and composed of individual warehouses that serve a single customer. They are usually built to order (and have the features and specifications that meet the customer's production or logistics needs, which leaves the property more personalized and less embracing to the market should it come to stay vacant.

Flex: composed by modular sheds that can be used individually or grouped. Generally, they are speculative, so they need to be flexibly constructed in order to meet the various size activities and demands.

Warehouses: intended for the storage of products are usually designed in modulations that allow receiving storage structures such as pallet trucks, making them ideal for wholesalers, logistics operators, among others.

Cross-Docking: ideal type of construction for carriers, since they are designed on platforms for handling cargo, and the immediate shipment to the final destination, not including stocking. The materials go from units to others, not needing to stay stocked. Typically, these have docks to service the vehicles, in order to organize the process of loading and unloading the materials.
Mixed: built more for general, diverse and mixed situations, preferred option for the Distribution Centers of the big retailers; it can be changed given its composition of being mixed for various functions and services.

Industrial: These industrial warehouses can be customized by the customer and can be used by various types of industries and can be located close to the factories to improve it demands.

At least, there is another classification, according to Colliers International: as different items (according to its technological evolution and its infrastructure for service, such as the available height), classified as A, B, C and High-Tech Logistics Condo.

As the correlation of factors to be considered as conditioners raised through the theoretical framework presents evaluation blocks, were opted to evaluate in three areas the indicators grouped to these areas and that will be presented. With this approach, the conditioners approach will be subdivided into the following specific criterion: social, technical-operational, financial and environmental. Each of the areas with their approaches in the aspects is presented below.

Social Aspect: In relation to the implementation of logistics condominiums and their coverage, it was decided to raise social indicators to follow the regions for implementation and evaluation as part of conditions.

For one of these aspects, the IFDM (FIRJAN Institute of Municipal Development) was considered, which is an annual study that tracks the development of all Brazilian municipalities in three areas: Employment & Income, Education and Health (SOBREIRA, 2012). As a global indicator, IFDM looks like IDHO, as Organizational Human Development.

As emphasized in the FIRJAN report, among the areas of development, Health has gained a new component: Basic Care Interventions: this indicator tracks hospital admissions that could have been avoided if basic health care services had been effective, hypertension or diabetes are examples in this regard. In addition, international parameters for infant death rates were incorporated, as well as the requirements regarding the care of pregnant women and the identification of deaths.

In Employment & Income, two new concepts were introduced: inequality and the degree of formalization of the local labor market. The former incorporates the traditional Gini index into the IFDM calculation, measured by the
remuneration of workers with a formal contract. The second concept seeks to measure the capacity of the municipality to absorb the local population, through the relation between the stock of workers with a formal contract and the population of working age. In addition, the salary variable was replaced by the salary mass, in order to capture the economic relevance of the municipality and, therefore, its potential to serve as a development vector for other municipalities.

Finally, in the IFDM Education, there was no inclusion of variables, but updating development parameters, which began to be based on 2010, on government targets and international standards. In this way, the requirements regarding teacher training and attendance in kindergartens and pre-schools, as well as abandonment and age-grade distortion rates were reinforced.

In addition to the IFDM, it was considered the Gross Domestic Product (GDP) of the Brazilian Institute of Geography and Statistics (IBGE) for its importance of having the production and income to monitor social index in the municipality and consequently in the region. In addition to the GDP index, there is also GDP with Value Added to Services. In the condition, as a comparison, GDP will be used. Both can be evaluated and used; in the example of the case study, the division of the use of the logistics condominium is by area of transport (services), foodstuffs (materials) and telecommunications (materials and services).

**Technical-Operational aspect:** According to the observations of Cushman & Wakefield (2013), the low growth of the Brazilian economy, mainly of the industry in 2012, did not affect significantly the market of logistics condominiums.

According to Ricardo Betancourt, Chief Executive Officer of Colliers International, the logistics condominium market remained stable in 2015: "Faced with the economic instability experienced in 2014, the results should be considered positive and our expectation is that 2015 will lead us to even better rates".

A technical-operational point is the occupancy rate. Historically, there has been an increase in the inventory of square footage and it is important to follow this index for evaluation if such growth is sustainable because it is being accompanied by occupation. However, with the complement of the Occupied Area, which is the composition of the discount of the occupancy rate for the total inventory in footage, it can be observed that even with advancement in the
implantation of areas of such condominiums; in conclusion, both the inventory of areas are increasing as their occupancy rates.

According to data published by ILOS (Institute of Logistics and Supply Chain), in 2013, about 40% of Logistics Service Providers (PSL) have at least one logistics condominium and the trend for growth of this sector is rising.

In addition to the occupancy rate, SOBREIRA in 2012 mentions the issue of distance to highways focusing on the state of Rio de Janeiro. It is important that the logistics condominium is positioned in cities crossed by a highway access to the city, which intends to carry out the urban distribution (in this case, the city of Rio de Janeiro). Thus, in recent years, the cities around the capital began to receive the cargo from the factories to be stored and then distributed in the capital. In addition to the land being in municipalities cut off by major access roads to the site that wish to make the distribution, the ideal is that the chosen ones make a detour with the highway itself for the access of the vehicles of load to the condominium.

The importance of being close to the highway and that it is in good state of conservation is also mentioned in relevance for the logistics cost that can be associated with freight and transportation, both for the issue of service and time, as well as safety and impact in the case of damages generated in the course. According to Wanke et al. (2011), from the point of view of costs, transport is responsible for about 60% of logistics expenditure, which in some cases can mean two or three times the profit of a company, such as the fuel distribution sector.

Along with being cut by an important highway access to the city of Rio de Janeiro, it is necessary that the city be not too far from the capital or large urban centers, otherwise it would not make sense that the place be a storage point for later distribution. Another important point that must be taken into account is the access to the rail modal.

Finally, another point to mention is the state of the highways. The Road Survey conducted by the CNT (National Confederation of Transport) in 2014 is based on the division of the evaluation blocks into Pavement (surface condition, speed due to pavement and roadway pavement), Signaling (central and lateral strip, Speed and visibility / legibility of them, intersection plates and defenses) and Geometry (type of highway and bridge / overpass condition, additional climb range, dangerous curves and presence of shoreline).
Economic aspect: According to COLLIERS, 2015, the rental price verified in 2014 ranged from R$ 19.30 per square meter (R$ / m²) to R$ 20.50 per square meter (R$ / m²), that is, difference of R$ 1.20 R$ / m², representing a percentage difference of 6.2%. However, in the same year, the General Market Price Index (IGP-M) closed the year with a rate of 2.66%.

Figure 10 shows the variation of average rental prices, in R$ / m² in 2014, followed by quarter and in the sequence between 2014 and 2015, remaining stable.

Rodrigues (2013) points out that in the face of the scenario in which there is a large number of stores dispersed throughout the city - a consequence of the multiplication of retail outlets - the storage of stores entails a high cost for a space that could be destined to more exposure of products to the end customer. It should be noted that the stores are located in valued areas of the city, while the CDs are built in peripheral areas, at much lower unit costs. In this context, there is a very important factor: the increase of the square meter (m²). According to FIPE, as Foundation Economic Research Institute (2012), few countries had a real estate value increase comparable to that of Brazil in recent years. By 2011, prices rose at an annual rate of 20 to 30 percent, on average, above national income, inflation and the yield of various applications.

However, among these analyzes, it is necessary to evaluate the question of market availability, which has been decreasing as has been discussed previously, since the employment rate is increasing and accompanying the growth of availability.

Regarding availability, there is a complex question, since it is difficult to find an affordable price to purchase land for the construction of a logistics condominium in the city of Rio de Janeiro.

In addition, another item of the economic criterion is the expected volume of investments in the municipalities in question, that is, those that are less than 100 km to the port of Rio de Janeiro, as shown in Table 12. In the case of representative investments, development will be necessary and such logistical need may generate demand for the use of logistics condominiums.

Finally, the last item of the economic aspect is the tax incentive through the reduction of taxes associated with the implementation and use of such logistics condominiums in partnership with public agencies. In the case of assessment of
criterion, if there is such an exemption or reduction of the tax volume, such incentive is welcome to the economic aspect of the enterprise and should be evaluated.

**Environmental Aspect:** Firstly, in order to have logistics condominiums in place, we must obey the legislation issue in the case of urban zoning and environmental licensing. According to CASTRO (2014), spatial analysis tools are essential so that land occupation planning is aligned with the legal bases of conservation and environmental preservation and the entrepreneur can visualize more suitable locational alternatives, avoiding future complications in environmental licensing.

In addition, as a conditional assessment in this aspect, there is a classification of type of logistical condominium that already considers the environmental issue when it comes to having the LEED (Leadership in Energy and Environmental Design) certificate. Such certificate is composed of seven-dimensional evaluation to prove the sustainable issue.

However, in the case the condominium does not have LEED certification, we can advance in the evaluation of the conditional on actions taken and verified with sustainability bias and with measurement and monitoring of the use of natural resources. In the case of reduction, the environmental aspect can be considered as being taken care of.

Another point to consider in relation to the environmental aspect is that such logistics condominiums can contribute to reduce pollutants of the environment, through the reduction of fuels. Rodrigues (2013) mentions that, at a time when the world needs action that favors the maintenance of a less polluted environment - both with regard to air quality and the reduction of the consumption of pollutant fuels - the centralization of Stocks is moving towards this target, even though this factor is not their primary objective.

In addition, using the definition of ecological industrial parks can also mention the actions focused on the environmental aspect, which in the logistics condominium has a characteristic because it is a complex infrastructure shared between companies. As mentioned by VEIGA, 2007, regarding the President's Council on Development, is an ecological industrial park characterized by a set of initiatives.
Finally, sustainability and technology actions that can generate resource savings and also financial, can also be better detailed. We presented actions to reduce water and electric energy in order to have the measurement of such reductions; but it can be complemented with other sustainable gains, which are very welcome these days.

**Keywords**

Logistic condominium; social criterion; environmental criterion; technical-operational criterion.