EVALUATION OF THE AIRPORTS ROLE IN THE PROMOTION OF SCALES INTERACTIONS BETWEEN TERRITORIES SPACES LANDSCAPES AND ENVIRONMENTS AND ITS IMPACTS ON THE LAND USE AND OCCUPATION SOURORUNDING BRAZILIAN AIRPORTS AREAS: A CONTRIBUTION TO THE URBAN-ENVIRONMENTAL PLANNING AND ENVIRONMENT PLANNING ON AIRPORTS SURROUNDINGS.

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SUMMARY

The research aims to identify and analyze the land use and land occupation in the immediate surrounding areas of the airports located in southeastern Brazil. The various forms and patterns of urban landscapes produced by the land uses and the resulting environments are pointed in their relationship with airport sites. The analysis of these relationships may make it possible to understand the complexities of urban environmental design and landscape present in the process of urbanization expansion related to airport activity.

Keywords: Planning, Airports, Use and Land Use, Environment, Landscape.

INTRODUCTION

This article is part of a broader research as a study subject of the land use and occupation research line of the Research Group: Use and Occupation of Lands in surrounding areas of Airports, certified by the Technological Institute of Aeronautics and registered in the CNPq - "National Counsel of Technological and Scientific Development, Brazil.

This study has been developed in a post-doctoral period at the Dipartimento di Urbanística do Instituto Universitario di Architettura di Venezia (IUAV), especially relating to Italian airports, and part of it at ITA at undergraduate level and graduate programs, especially in the Brazilian cases.

It is relative consensus that airport activities contribute to the dynamism of economies in local, regional, national and in some cases worldwide. They also sometimes play a significant role towards the growth of urbanization and its impacts on immediate surroundings.

In order to establish appropriate conditions for the functioning of the airports, their environment, accessibility and avoiding environmental impacts, are established operational norms, territorial and environmental issues at different levels: international, national, state and local. At the international level the activity is regulated by ICAO - International Civil Aviation. At the national level, each country seeks to establish their selves a management structure and regulations in order to meet the assumptions, operational, safety and environmental goals set by ICAO. In Brazil regulation and airport management at the national level are, since 2005, made by the ANAC, the National Agency of Civil Aviation and INFRAERO - Brazilian Company of Airport Infrastructure whose mission is to provide the infrastructure and airport services with safety, comfort, efficiency and commitment to national integration.

ANAC's mission is provided in the articles: 5 of Law No. 11.182 of 27 September 2005, which states that acts as the Civil Aviation Authority, and 8, which states that ANAC should "adopt the necessary measures in order to attend the public interest and for the development and promotion of civil aviation, the country aviation infrastructure and airports, acting independently, legally, impartiality and publicity.

In this sense ANAC beware of regulating the equipment and airport activities in Brazil and in respect to land use, adheres to legislation and regulation given distance, jigs and restrictions for use and occupation in the immediate surroundings of airports, especially to meet the effective and efficient operation of the airport, avoiding obstacles to landing and takeoff and protection with respect to disturbances arising from the noise of aircraft operation.

In Brazil, the municipalities which ones has airports, thus, in one hand are subject to a law to which they had not taken part and on the other hand do not count on its staff with technical expertise for dealing with legislation affecting the airports sites and surrounding areas.

Thus, in most situations, municipal plans and projects do not incorporate the airport as a production unit and a factor of integration and development at scales that can contribute to urban development.

It is vital to better understand this modal, look forward to make relationship more effective and promising to the city where they operate, innovate in the construction of regulatory instruments, incorporating the environment and exploring the landscape that arises with and from that modal.

Considering these facts are presented in this work the preliminary results in the research of use and occupation in the vicinity of airports and its relationship within landscapes shapes.

THE RESEARCH

Airport is not a new issue; city is not a new issue. Airportcity is a city, landscape, architecture, and urban theme for the twenty-first century. If one think a little about "project," "plan," in these expressions are the way one thinks future and includes another way to deal with the past - the dynamics implied in the cities that are sustainable since they can cope with the changes. It is to think not only in aspects of ecological and environmental balance in the direction of the elements of nature, but to think that the cities are in constant and continuous transformation. More and more we study the links, associations, dependencies, connections. And no doubt the connection airport / city have few studies.

At the global level is not recent a change of focus in relation to airports, they are analyzed and discussed as city airports, urban extenders, equipment rub and pulsate in the city. Displacements, continuity, business opportunities, given the not so recent opportunity that drove the Barcelona airport and its restructuring to urban roads and from the strategy adopted when the Olympic Games, and more recently the renovation of the airport and its surroundings in Athens, see also the investments with the construction and urbanization of the Beijing airport for the 2008 Olympic Games, reorganizing access and areas around, changing the landscape and environment, preparing it for the future and now South Africa mobility system - airport, highway, rail - running on different scales thought as inter and multimodality for the next football world cup.

It is known that infrastructures in the case of transport have always been important: railroads are an example. Air transport is a transport and movement modal of fundamental importance to the physical and functional articulation of the countries in the unequal globalization of the 21st century, as the same way navigation has been in the 16th century and as the railroad was in the 19th century. In contemporary society, of urban culture in a small planet, involving various forms of mobility, culture and growth to a desired urban development creates many difficulties for everyone.

In Brazil it is possible to recall the role of aviation as an option for national integration by virtue of the size of its continental territory. That was indeed a factor of an interaction scale, as well as the implementation of the National Air Mail - long before the Internet - connecting people and places.

In addition it is necessary to point out the 15th Pan American Games in Rio de Janeiro in 2007, which demanded efficient infrastructure and effective investments in the city equipments including mobility. For 2014 year, it has been thought to modernize, expand and build the airports to meet the Football World Cup and also is an entire investment to be made for the 2016th Olympic Games which will take place in Brazil. In this role, the recent investments announced for Viracopos airport in Campinas City, São Paulo, and a glimpse of a new airport at Sao Paulo state, point to adopt proper conducts not only with its own

internal logistics of the equipment, but particularly so with the contour prediction, mitigation and redevelopment territorial impacts resulting from their immediate surroundings.

As so I point out the role that the airport may have and indeed has, in spatial arrangement and the business opportunities which may arise. This requires glimpse at airports less than travel stations and more like local focus and places to promote opportunities.

Definition of Goals:

The research aims to identify and analyze the land use and land occupation in the immediate surrounding areas of the airports located in southeastern Brazil. The various forms and patterns of urban landscapes produced by the land uses and the resulting environments are pointed in their relationship with airport sites.

The analysis of these relationships may make it possible to understand the complexities of environmental design and landscape present in the process of urbanization expansion related to airport activity.

It is also of interest in this research aspects related to the understanding of the inter scale connections in which consider the movement - movement, interaction, exchange etc. in several scales, as factors with a strong presence in the urban setting.

THE STUDY AREA

The growth and concentration of population in Brazilian cities over the last three decades, and the fragmentation of urban formations were marked by a dizzying pace, especially in the southeast where industrialization and the resulting urban sprawl are remarkable both for spreading and compaction, filling areas previously designated for other uses that do not necessarily urban in the first case and transforming areas for change of uses, diversity and intensity in the second case.

In this region the air transport is heavy; it has modern airports - Cumbica in Sao Paulo, Galeão - Tom Jobim - Rio de Janeiro and Belo Horizonte Confins. The airlift Rio de Janeiro / Sao Paulo is one of the busiest in the world in number of flights and mainly uses the hub of Congonhas in Sao Paulo and Santos Dumont in Rio de Janeiro. There is an air bridge with reasonable movement also in the Pampulha Airport in Belo Horizonte. Sao Paulo today is among the 30 busiest cities in the world air transport - number of flights, passengers and cargo. The headquarters of the majority of Brazilian airlines is also in the Southeast. Highlights also include the movement of transport executive - the 2nd largest fleet in the world - and business air taxi as the leader in Belo Horizonte and TAM in Sao Paulo - the most modern and largest in the world.

The axis Sao Paulo - Rio de Janeiro, located in this region, with the tendency to form a megalopolis that extends in a valley cut by the Paraíba do Sul river framed by two mountain ranges to the sea and the mountain range, provides an identification of specific-sized cities medium with the possibility of formation of intermediate cities as the cases of São José dos Campos and Taubaté. (Figure 01)

They suffer no doubt influence of the possibilities of long-distance mobility, including the aviation modal, by its insertion site needs to use this air transport modal from locations with

which ones it keeps relative distance but also the relative proximity, this is the case of airports located in the cities of Sao Paulo, Guarulhos, Campinas and Rio de Janeiro.

Figure 01

Major Airports located in the Brazilian Southeast Megalopolis

Source: Google-earth image -2009 processed by the author.

THE AIRPORTS

As a procedure to chose the airports to be studied, was originally drafted a role with the cast of the main airport located in southeastern Brazil, in which is included: the state where it is located, the number of airports per state, the ICAO airport code, the name of the airport and the city where they are located or which is related to proximity, the manager entity code, the movement of passengers and cargo.

Airports chosen to be studied are due to the fact that the southeast is a region that has been highlighted with regard to the Brazil's socio economic dynamics, which are the larger Brazilian airports. Added to these considerations are the possibilities opened to the expansion of airport activity in the country at the World Cup in 2014 and the Olympic Games in 2016.

From this role and with the aid of Google-Earth images and information obtained at the ANAC and INFRAERO sites it was possible to identify the location of airports in the Brazilian territory and determine its size and the movement; airport site dimensions runway, terminal layout, access. This information combined with the option of a geomorphologic characteristics, plus the relative proximity of airports and specificity of *"function"* of each one contributed to the final selection of those who came to be studied.

The next path was a procedure to identify the use and occupation of land in the immediate surroundings of the six selected airports throughout the southeastern Brazilian metropolis.

A first step was to check the web site of the airports, regarding the configuration of the airport site, the noise curves; reports of environmental impacts or mitigation measures, and reports or plans to develop the airport activity and enterprise budget. With these information in hand next step was to check on Google-earth images of airports and their insertion in the community territory.

It should be noted that the study was developed with the main concern of presentation the nowadays ways to use and the zoning in the immediate surroundings of airports, their relationships with environmental issues and with the landscape, conflicts with the relevant legislation and the airport activity and the development plans established for these areas.

Due to the characteristics of the predominance of urban activity in most areas near the airports studied it was chosen to demarcate those situations where it was possible to identify buildings which are apparently permanent housing or not, corporate offices, warehouses deposit materials and machinery, industrial buildings etc. Thus the choice fell on areas actually built with some type of use and occupancy.

The tissues with predominantly urban appearance were taken with mixed-use, since it is the characteristic land use in this region. Exceptions were made for those situations where occupations look like big *continuum* built areas which denotes industrial activities and / or big commercial corporations or government buildings.

A distance of 1.5 km to 2.0 km from the boundaries of the airport site was adopted as the basic criterion for the radius of coverage of the analysis of the use and occupancy of the surrounding area. This distance size varies up or down due to specific situation where the occupation showed thinner, in other cases the occupation seemed so intense and continuous the radius extension was imperative.

The *"design / demarcation"* of specific land use was developed on the platform Google Earth, partly because this seemed to be a platform with a reasonable level of reliability, since it's not required for this study all levels accuracy of the classification of areas in its square footage (sq. m.), nor as regards the detailed design of this or that particular point. The basic premise of the study was to identify patterns and usage land and the amount of occupied areas in the vicinity of the airport sites. A second premise was to try to verify these occupations attendant of the legal and environmental aspects of areas surrounding the airport, its functional relationship with airports, and the morphologies of landscapes from both: airports as a inductor of integration of the uses, and forms of occupation in their surroundings.

The airport and its immediate surroundings

Analysis of selected airports is made up of a collection of images with the location of airports and their immediate surroundings, where one can infer the patterns of use and occupation of urban roads and distances on the main points of interest such as the urban centre, railroads, highways, etc. On figure 02 is shown an example of Protection Zone Plan.

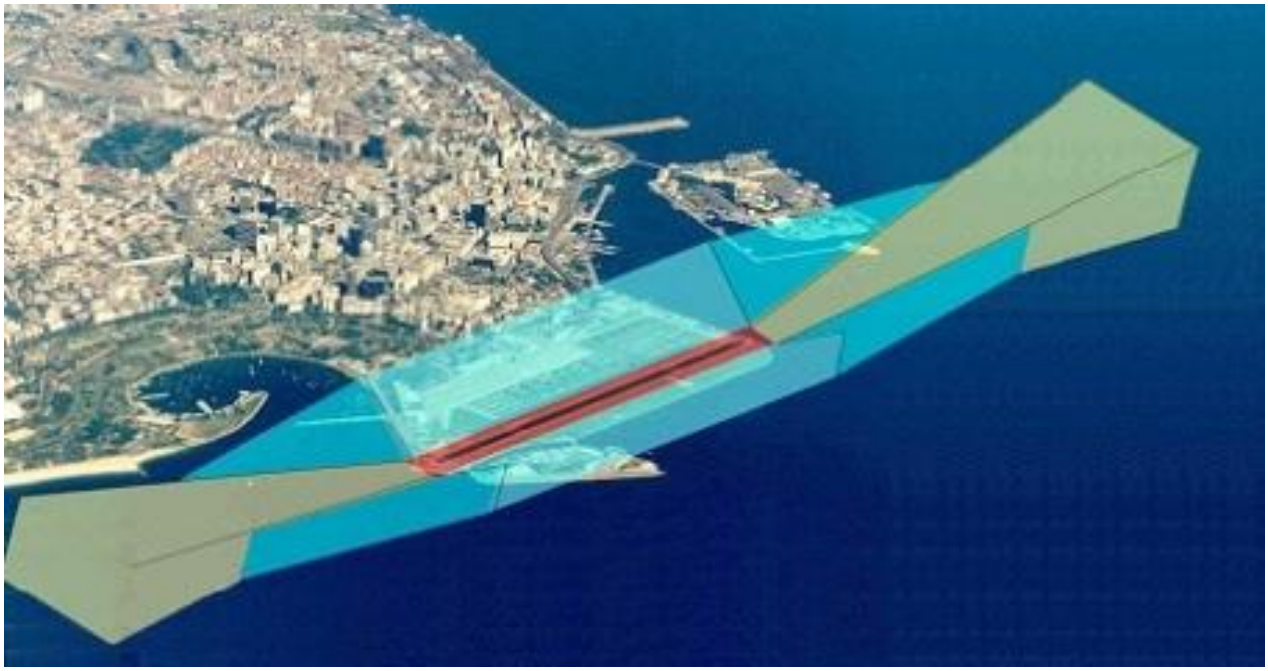

Figure 02

Example of an Airport Protection Zone Plan – Santos Dumont Airport

Source: ANAC Appud Nykiel, 2009.

On table 01, below, it is pointed the approximate distances between the six selected airports.

Table 01 - APPROXIMATE DISTANCES STRAIGHT LINE BETWEEN
SÃO PAULO / RIO DE JANEIRO MEGALÓPOLIS AIRPORTS

Origin	**Destiny**	**Distance in Km**
VIRACOPOS	Congonhas	085,7 km.
	André Franco Montoro	082,5 Km.
	São José dos Campos	133,5 Km.
	Antonio Carlos Jobim	401,3 Km.
	Santos Dumont	407,4Km.
CONGONHAS	Viracopos	085,7 km.
	André Franco Montoro	028,4 Km.
	São José dos Campos	092,3 Km.
	Antonio Carlos Jobim	359,7 Km.
	Santos Dumont	366,5 Km.
ANDRÉ FRANCO MONTORO	Viracopos	082,5 Km.
	Congonhas	028,4 Km.
	São José dos Campos	065,7 Km.
	Antonio Carlos Jobim	336,7 Km.
	Santos Dumont	344,7 Km.
SÃO JOSÉ DOS CAMPOS	Viracopos	133,5 Km.
	Congonhas	092,3 Km.
	André Franco Montoro	065,7 Km.
	Antonio Carlos Jobim	270,7 Km.
	Santos Dumont	279,5 Km.
ATNÔNIO CARLOS JOBIM	Viracopos	401,3 Km.
	Congonhas	359,7 Km.
	André Franco Montoro	336,7 Km.
	São José dos Campos	270,7 Km.
	Santos Dumont	015,5 Km.
SANTOS DUMONT	Viracopos	407,4 Km.
	Congonhas	366,5 Km.
	André Franco Montoro	344,7 Km.
	São José dos Campos	279,5 Km.
	Antônio Carlos Jobim	015,5 Km.

Following are the comments and analysis produced for each of the six selected airports.

In the International Airport Antonio Carlos Jobim, located in Rio de Janeiro, by virtue of its location in one of the borders of Ilha do Governador, nearest the continent, there is in the eastern, north and south of its immediate surroundings, no conflicts of use and occupation, mainly because this area is largely occupied by sea water surfaces. However, at the western remains a dense occupation from nearest surroundings of the airport site, to the border of the island with the sea. (Figure 03)

The texture and the density of occupation are urban mixed with some irregular and/or illegal occupations – usually called *favelas, "slums"*. These ones perhaps the most affected by nuisance and subject to more risk of landing and takeoff accidents arising from airline activities.

Aside the location of the Federal University of Rio de Janeiro, which can stand in relative peace with airport activity, mostly because of its position, located in relatively remote and distance out of the curves of noise, there is an occupation inadequate in the immediate surroundings of the airport, causing conflict and urban friction, not taking advantage of the potential that the equipment poses.

Also the airport is well served by access networks, both locally and over long distances, it is observed that the conditions for mobility / accessibility are very committed on the basis of the prevalence of shift car, where congestion is constant aggravating the sense of time and distance.

The landscape and environment that are produced shows strong contrast between the airport and its immediate surroundings, where morphologies breaks are strongly identified and the airport seems like an enclave.

Figura 03
International Airport Antônio Carlos Jobim.
Google-earth Image -2009.

At Santos Dumont Airport, also located in Rio de Janeiro, its position at a landfill on the sea, forming a peninsula ally to its runway position, there are no use conflict and occupation in the immediate surrounding area with regard to noise and the possibilities of accidents due to landing and takeoff, involving populated areas. (Figure 04)

One of its major limitations perhaps refers to the scaling of the runways and approach procedures over the bay of Guanabara, in this densely populated coast. In fact there still not seen conflicts in the use and occupation.

Nowadays Santos Dumont Airport has been widely used for regional flights, giving place the International activity solely to the Airport Antonio Carlos Jobim.

Regarding also landscape and environmental subjects there is no conflict or friction, or even morphologies breaks, this is due in part to its location and partly due to the design of the terminal and its implementation with a square front, in addition to being neighbour to the Flamengo park . Also it is largely known that the buildings closest to the airport were built during the 40's / 50's years, and most of them are used as Government Offices, Hotels, Enterprises and some apartments.

Figure 04
Santos Dumont Airport.
Google-earth Image-2009.

Viracopos airport in Campinas city at São Paulo State is an international classified airport and functions as an option for flights towards and from Sao Paulo city. Currently it is preferential used as International cargo airport. (Figure 06)

It is also one of the airports chosen to receive the movement generated by the implementation of the FIFA World Cup in 2014 and the Olympic Games in 2016, due to its infrastructure, its strategic location near to Sao Paulo and the countryside, counting with the

implementation of TAV - High Speed Train, which should make the connection Campinas / Sao Paulo / Rio de Janeiro, currently in preliminary design. (Figure 05)

Figure 05
TAV – High Speed Train- Primary route design.
Source: Halcrow /Sinergia Report – Vol. 2 Design Study – 2009.

In its immediate northern and south-east surroundings, there is an intense, dense and continuum occupation. It is predominantly residential fabric with a few insertions of mixed uses. Although, the airport site, therefore because of its distance from the more urbanized area, even considering the orientation of its runway, it can be inferred noise problems especially in the southeast, where there is intense occupation and urban expansion areas. One should also consider the plans to expand the airport with investments that will transform it in the major international cargo airport in Brazil, with doubling runways, terminals, patios, storage areas, etc.

> Viracopos Airport will be expanded 30 times in order to reach Governador André Franco Montoro International Airport cargo demand. This one, even with another terminal, and Congonhas airport can not afford to forecast the environmental impact. Study shows that the flow of passengers in SP should go from 34 million to 115 million by 2025.
>
> Infraero, the company that manages these airports, want invest U.S. $ 6.4 billion by 2025 to make the Viracopos airport in Campinas, the busiest in the country. It is expected to increase by more than 30 times the capacity of the airport, enabling him to receive 61 million passengers a year by 2025-or 4.6 times the total passengers passed through Congonhas last year
>
> Estimation of ANAC for 2025 provides for a movement of 115 million passengers per year. Last year, Viracopos accounted for only 1.08 million of 34 million passengers in three airports. However, as far as Congonhas and Governador André Franco Montoro Airports already work with

> saturation and not the third terminal to be built in Governador André Franco Montoro Airports will report on the expected demand. So, Infraero wants to expand Viracopos, now used mainly for cargo. The Ministry of Defence, however, already has plans to build a third airport in São Paulo, even without time and place set.
>
> The expansion plan set out in the Environmental Impact Assessment for the expansion of Viracopos, that the project will gain a second runway, a new passenger terminal and 13 times larger than today and a courtyard of aircraft with twice the size by 2015 date scheduled for the end of the first major phase of expansion.
>
> The area planned for the expansion is 27 million square meters, more than three times the current equivalent to twice Governador André Franco Montoro International Airport or 16 times the area of Congonhas. The forecast is for construction to start in September this year, with completion of the second runway for landing at the end of 2011.
>
> Ricardo Sangiovanni – Newspaper notice - Folha de São Paulo, Monday, 16 February 2009.

It is considered that the extension of its functions and infrastructure will cause significant impacts in its immediate surroundings, such as: incommodity by noise due to the increase of flight movements, increased risk and danger in relation to accidents, and the increase in road movement and pollution particulate matter. The non-articulation of plans, programs and projects in order to appropriate use in the vicinity of an airport with a high potential of attraction and generation of movement is likely to be configured as a waste of investment and opportunities.

Figure 06
Viracopos Airport.
Google-earth Image -2009.

Sao Paulo International Airport, Governor André Franco Montoro, nowadays is considered the main airport for international flights in southeast Brazil. It is located in Guarulhos city in the metropolitan region of Sao Paulo, (Figure 07)

It has good and efficient infrastructure for passengers and cargo where it can be quoted the TAG -General Customs Terminal - one of the biggest cargo terminals in Brazil. Its location in relation to Rio de Janeiro and Sao Paulo has made it of particular interest to the connections of both national and international long distance flights.

Also the airport is well served by access to highways, it is important to remember that these roads are a land connection between the two major centres of financial and productive activity in Latin America and where there focuses most generation and accumulation of wealth in Brazil. These conditions puts the highways system always on the edge of saturation, occurring constant traffic jams, road accidents, causing delays and unnecessary waste of time. That is itself a factor of disturbance and environment impact.

Its surroundings is intense, dense and continuous occupied. These occupations are woven of mixed use with very strong presence in residential use. Large parcel of these occupations is located in an inappropriate area, within the noise curves, which are not only illegal and irregular, is environmentally incorrect, and because the nuisance harms human health irreversible and cumulative. Another aspect that it can be pointed refers to the difficulty that these conditions of occupation and use in the immediate surroundings of the airport, places for possible expansions of its facilities and its flight movement.

It is pointed in this case also the inadequacy in the immediate surroundings, and the impact on landscape and environment of uncontrolled urban occupations - invasions, irregularities, etc. The uncontrolled urban landscapes look poor, where public spaces and community uses ceases to exist, giving way to roads and other uses, creating landscapes of friction and their morphology reveals the conflict between uses and urban shapes.

Figure 07
International Airport Gov. André Franco Montoro.
Imagem Google-earth Image -2009.

Congonhas airport in Sao Paulo is one of the oldest airports of Sao Paulo city. Its location in an area originally far from the centre on an undeveloped land was suitable for it and was also a strategic and decisive contribution to the urban sprawl in the southern city direction. Initially its surrounding lands were without occupation and use, but over the years, public investments in roads infrastructure, valued the land which resulted in development projects and urbanization towards the airport area. (Figure 08)

It is not the opportunity to argue about Sao Paulo city urbanization process, but it is very well known that the occupation of the whole area immediately surrounding the airport was the result of a strong housing activity which appropriated the public infrastructure placed there when the infrastructures facilities to reach the airport where built. Over the years what happened was an intense use and occupancy of the immediate surroundings of the airport site, a little due to the appreciation of land and a little depending on the attraction that an airport as "modernity" has provoked.

Nowadays the immediate airport site surroundings is intense and densely populated, including vertical tall buildings. There is a very significant residential use, and airport operations are noisy and with the possibility of accidents. Due to accidents involving fatalities and serious damage in near by urban areas in recent years, the population is straining the airport function noise.

It is not the case to discuss who came first, it is known that it was the airport; the case in discussion in fact is the inadequacy of uses and forms of occupation in the immediate surroundings of an airport. The images showed the degree of strangulation and friction between the uses and disjointed landscape produced. Access is time consuming and complicated, on urban roads with heavy traffic, and there is a component of pollution by increasing the stress to passengers. The operational control zone minimizes but does not resolve issues related to environmental impacts, we must adopt deeper changes in order to ensure the adequacy on the airport operations as well as the best and most appropriate use of its surroundings.

Figure 08
Congonhas Airport.
Google-earth Image -2009.

Airport Prof. Urbano Ernesto Stumpf in Sao Jose dos Campos, between the city of Sao Paulo and Rio de Janeiro, is very special and different from others. Originally designed as aircraft testing airport for the first and now most important school of aeronautical engineering in the country, the ITA - Aeronautics Technological Institute - was absorbed as well as throughout the campus for the institute by a military entity of the Aeronautical Command of the Ministry of Defence. The old campus became the CTA - Centro Tecnológico de Aeronáutica, in which is now installed on the ITA. (Figure 09)

The infrastructure of the airport was built in attention to the interests of the CTA and Embraer - Empresa Brasileira de Aeronautica, - an institution created to become the Brazilian aeronautics industry, unique in Latin America to produce aircrafts.

Beyond these uses, the airport also has a mixed-use activity serving as a civilian airport to airlift between Sao Paulo and Rio de Janeiro, especially business travel. There is also seasonal charter tourist flights.

Its use as a Passenger and Cargo International Airport is suffering the negotiation difficulties among the various managing agents which use the airport and the regards of the infrastructure to be deployed despite the excellent runway.

In its immediate surroundings the most critical situations are locatede north and south, where there is intense occupation by invading the noise curve. In the northern segment there is a beginning of vertical and consolidated tissue. The southern portion is occupied by bands of intense low-income and intensification of blends with predominantly residential use.

Despite an excellent infrastructure, access and interconnection to the coast of Sao Paulo and the countryside, there is neither plan to expand its activity nor a plan to circumvent the problems of conflicting use and occupation. This could become an important airport in support of industry and foreign trade.

Figura 09
Airport Prof. Urbano Ernesto Stumpf.
Google-earth Image-2009.

DISCUSSION

In the cases studied, airports located in the south-eastern Brazilian megalopolis, it is possible to identify patterns of use and occupation in their immediate surroundings where the constant was high density occupation, continuum urban areas and the predominance of mixed use with residential use predominance.

It was also found in the images that the cases studied are big airports, equipped with sophisticated access infrastructure, establishing itself as transportation equipment with an aspect of modernity and technological futurisms.

Often, most of the airports are inserted very close to densely populated areas, it is clarified that it is known that insertion in populated areas was not the main original option to locate these airports. In all cases studied the predominantly urban occupation and uses in the immediate surroundings and with high density occurred after the implementation of the airports. This characteristic to aggregate urban areas by virtue of its ability to attract is present in almost all Brazilian airports.

Even control laws for land use can be observed in all cases studied, the existence of legislation at the municipal level for land use and occupation of urban land, not necessarily contains aspects relating to the environment of airports. In this case, the surroundings of airports, it can be seen that all airports studied include the Specific Noise Zoning Plan, which is the instrument that impose limitations on the use and occupation in the vicinity of the airport sites.

On the other hand it was possible to verify the constitution as law, of the Specific Airports Zone Protection Plan only for Santos Dumont airport in Rio de Janeiro, and Viracopos and Governor André Franco Montoro in Sao Paulo. This at first can point to a concern that the other airports studied do not have protection plans establishing the cones of approach - landing and taking off - and the surrounding protection areas.

In fact this is unfounded because it is known that the airport under the ICAO and Brazil regulations can only operate after being approved by the presentation of operation plan in which is included the protection plan. The lack of information in this study due to difficulties in its location to official documents on the websites of agencies surveyed.

The land use, occupation and urban fabric in the immediate surroundings of the airport sites should then be guided by the mechanisms of control and limitations, but is not taking place in the cases studied.

Part of it stems from the fact that municipalities develop their laws and the land use of those areas surrounding the airport should be compliance with the restrictions contained in federal law - Ordinance 1141 GM5 in Brazil's case - and across the fact that the restrictions contained in the Ordinance mentioned above have been prepared and published in the mid

of the 1980s, when most of the airports and the occupation as well existed in their surroundings.

Another factor contributing to this situation that affects the level of unsustainable due in Brazil is the historical practice by real estate developers openly flouted the law and fraud it in a political situation where the mechanisms for monitoring and penalties have been very fragile and in some cases omitted generating uses with high incompatibility.

It is known that this is not the privilege on the areas surrounding airports, urban areas in most Brazilian cities are in the field of irregularity and illegality in relation to planning legislation. Whether by ignorance or by express intention of breaking the law, either by virtue of the difficulties in implementing legislation that has been configured as a complex and difficult set of forms and formulations sometimes impossible to apply.

The municipal authorities in turn have to deal with an equipment – the airport - over which they legislate, and imposed by federal law to municipalities unless they can not even express. Changes are necessary; both in the airports managers, in the municipalities' managers, in the real estate developers and in the politics, to find solutions to attend the multiple interests involved

FINAL CONSIDERATIONS

In general, and in particular to the regulatory and certification entities, the most significant environmental issue within airports, regard to noise, noise commands and directs the other criteria, such as limiting the hours of aircraft movement, limitation of using soils, distances and mitigation measures.

> The classification of airports as to the environmental noise is directly related to the population living in the noise curve, this is because the number of people exposed to noise implies a greater potential for discomfort and complaints.
> The environmental risks related to noise is related to the potential of land in the curve area of each airport. Thus, the areas around the airports with the greatest risk of impact, they must somehow be monitored in partnership with city agencies, to ensure recognition of the potential of settlement and land use, and the invasion by populations. (Nogueira, 2006)

Due to this understanding is that the ICAO has been focusing efforts to minimize noise impacts, taking them as the central environmental issue. For what drew the balanced approach as follows:

> Balanced Approach

> ICAO / 33 Assembly / October 2001 - Philosophy for Controlling Noise Airport Complex - resolution A 33-7 (replaced by 35)-Balanced Approach based on four lines of action:
> 1. Reduction of noise at source (aircraft);
> 2. Planning and managing the use and occupation of land in the vicinity of airports;
> 3. Procedures to limit the emission of noise;
> 4. Function time restrictions.
> (Nogueira, 2006)

We seek to expand that understand the environmental impact in addition to noise, requires a change itself, the environmental impact are made largely also because of the uses that set up around airports, and those settling under the attraction of the airport has combined with the lack, the absence of efficient supervision, but mainly because the areas around airports have been shaped up as waste spaces, such as areas to be appropriate by anyone, they are generally understood by the entities managers as not being within his authority or his interest, they are only a land subject to restrictions.

I think that to minimize the impacts from the forms of land use and settlement in the vicinity of airports requires some forms of effective partnerships between the various entities involved: as managers, the municipality, the citizens directly affected, developers, system operators in searching and formulating plans, programs and projects with its effective implementation which can take as much advantage as possible of an expensive and sophisticated equipment, essential in a global and plural society, which is increasingly urgent effective interconnections.

The airport should be seen as a field of business and opportunities for all. Brazil is already testing instruments such as urban operations, the operations connected, the PPP - public-private partnerships. Why not use them in relation to the airports to ensure and implement the transformation of use and environmental benefits for all? Why not think about doing an assemblage of interest orchestrated by the state to challenge deep structural changes in the urban design on the immediate surroundings of airports?

With the implementation of plans to reorder these environments, the resident population can be rearranged giving place of critical nuisance and risks areas to business activities, trade and industry, which requires less time to local staying , regrouping in places more remote and secure, appropriating the advantages of generating jobs and income from new activities, restructuring and reordering its immediately surrounding, it redraws space, creating new urban fabric with the environment as a buffer protection and transition zone as a new central business beating.

The continuity of the research seeks refine the analysis by using remote sensing reading images techniques, the application of geographic information system in association with the database so far made to organize a collection of cases indicating the advantages or disadvantages and potentialities or limitations.

Thus the final total research in two parts, both Brazilian and Italian, is intended to produce a set of information organized in files and database on the airport and its surroundings, the treatment and ownership of these areas, the legal apparatus and methods of construction which allows the control and encouraging the most appropriate ownership and use of the opportunities that an airport can provide.

The end product should be constituted, therefore, as a database of cases studied, where the critical view should point processes and procedures and be constantly updated and expanded even been serving as the information basis to indicate planners in various spheres, procedures in the implementation and expansion of airports and their peculiarities as urban facilities that organize the territory in multiple scales. Useful no doubt also to the municipal managers to demystify the airport as a problem and present it as an advantage.

Last but not least I would like to remember that in most Europeans cities there been made efforts to understand airports beyond a transport modal but as airportcities, integrated and promoting integration between cities, regions and countries. As you can see below the airport meaning as a node of bussiness and opportunities is not so new.

> "The situation at the airport in metropolitan areas make indispensable designing comprehensive strategic plans, covering both planning and transportation planning. The creation of transport infrastructure and real estate development in the airport area can no longer be considered separately. The uncontrolled exploitation of the attractiveness of the airport property usually precede infrastructural investments. This is puzzling, as threatening the overriding need to maintain accessibility of the airport itself, which is not only essential to the airport, but also a precondition for development, as it ensures that the area attractive for investment ... ...
>
> The joint development of both concepts would be highly desirable, but difficult because the responsibility for planning and infrastructure are often divided between the local and regional authorities. Because of this separation, the infrastructure has been for too long a more or less delayed fuelling the growth of metropolitan areas, ie a more or less urgent complement to economic development. We must recognize the ability to guide and promote development through investment in infrastructure. , Now more than ever, the infrastructure is a strategic tool that must regain its importance in urban planning. "
> (Gueller & Guller, 2002, pgs. 180 e 181)

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