
ECOMOD'2006 International Conference on Regional and Urban Modelling

[Economic modelling techniques applied to regional and urban issues]

Free University of Brussels, 1-3/6/2006

Primary topic: Urban issues; Secondary topic: Developing countries

Urban clusters as strategy for productive restructuring and urban regeneration: from San Francisco Mission Bay to Sao Paulo railroad brownfield

Carlos Leite

Arch.; M.Sc.; Ph.D. [Sao Paulo]; Professor at the Postgraduation Program in Architecture & Urbanism, Mackenzie Presbyterian University, Sao Paulo; Visiting professor at the Cal Poly University [California; Fall Term 2004]; Coordinator of the Urban Clusters Research Group [cleite@educatorium.com; www.leitebrooke.com.br/leite_clusters_1.html]

Key-words: Innovative environments; Productive restructuring; Urban regeneration; Clusters; Technopoles; Sustainable redevelopment; Deindustrialization & Reindustrialization; Wastelands; Brownfields; Terrain vague; LED

"Our aim must be to achieve a new dynamic equilibrium between society, cities and nature. Participation, education and innovation are driving forces of the sustainable society."
Richard Rogers

Introduction

Strong territorial mutations emerged in the post-Fordist city, more emphatically after the reorganization of the spatial economy on the last decades. The industrial decline - deindustrialization - generated the emptiness of entire urban areas. The metropolitan territory became, suddenly, depository of enormous transformations and urban abandonment and wastelands had become particularly evident on the contemporary urban fabric: underutilized industrial zones, non-used industrial warehouses and deposits, abandoned buildings on the inner city and deactivated rail yards [wastelands, brownfields and *terrain vague*].

On the other hand, new forms of local development are appearing on the wave of the New Economy - IT economy - potentially offering new and rich subsidies as possible answers to the above described urban picture.

The local productive systems emerged in some cities of the globalized world and, under the approach of the technological innovation of the production, have appeared the innovative environments - *millieux innovateurs* - while strategies of local development.ⁱ

Therefore, it seems urgent to study and better understand these new positive impacts on the urban development of the productive territories under transformation in these contemporary cities. Particularly, clusters seems to be a quite precious instrument of local development strategy in the new bases of territorial "refunctioning" - to give new functions for the territory under urban regeneration - in the cases of innovative reindustrialization areas.

The interest here is to raise some questions concerning the possibilities of local development of these immense urban territories in productive transition through the new strategies that come upon from the innovative environments and clusters.

Been working with urban regeneration programs since some years, more recently we have been searching to analyze alternatives for the territories in process of productive restructuring of the contemporary metropolis. Urban strategies and projects in these territories must operate new functions and productive programs: differently, therefore, of the urban revitalization programs traditionally developed on central areas, normally consisted of cultural, tourist and cenographic bias. In the current picture of



global competition of cities and city-regions, the programs of productive reorganization must search to unite competitiveness and innovation through some opportunities generated by the new productive systems.

How creative strategies to reconfigure the urban dimension and the sustainable redevelopment can be generated from the new formats of local economic development [LED] - innovative environments and clusters?

Which are the possible conclusions generated from the correlation - quite non explored until the moment - from the "urban dimension" and the effects of the new "local productive arrangements"?

If the configuration of the well developed clusters presents a synergic cooperation between firms, research and community in a geographically clear-cut territory and they have been analyzed through economic and entrepreneurial parameters, what constitutes them under the urban and architectural prism?

Our multidisciplinary research - congregating urbanism, economy and administration, urban geography and sociology approaches -, methodologically acts in two complementary fronts:

1. Critical analysis of clusters models and typologies:

- Accompaniment of the trajectory of the pioneering study-cases and its possible striking for our local reality. Selected study-cases: San Francisco Mission Bay urban project is the main one and it is discussed here.
- Definition of models and typologies: definition of characteristics and parameters of functional, formation, typical development and context aspects.
- Objective: in terms of reorganization of areas under productive transformation - reindustrialization - it has possible striking of the consecrated international cases for our local reality, the urban deindustrialization process of Sao Paulo?

2. Development of identification criteria and urban mapping on the specific territory of Sao Paulo railroad axis brownfield:

- Urban/economic mapping for identification of local productive arrangements in consolidating process/emergency of potential clusters;
- Specification of its characteristics, analysis of its productive structure and determination of vocations and growth potential in the reality of the metropolis of Sao Paulo: a "glocal" city.
- Objective: mapping of local productive arrangements in the central area of Sao Paulo and identification of possible urban clusters.

San Francisco Mission Bay urban regeneration and productive restructuring project

The San Francisco Mission Bay urban project, part of the port area of San Francisco redevelopment process, comes being constructed under coordination of the private company Catellus Development and intends to be a model, complete and innovative, of urban redevelopment on a metropolitan wasteland: an urban void of 303 acres. The whole project proposes to create a housing support for 10 thousand inhabitants, a zone of commerce of high quality, a biotechnological area of laboratories and companies – the biotech cluster –, an enterprise zone of high technology, a hotel with 500 rooms and the new campus of biotech research of the University of California in San Francisco – UCSF.

The biggest functional element of the project is, of course, the scientific campus and of biotechnological companies of the UCSF. Calculated in 4 billion dollar, the Mission Bay Biosciences Campus will be the greater propeller in the local economic development of this traditionally industrial area, an old brownfield territory. The campus started to be constructed 10 years ago and its first phase entered into operation in 2003. When concluded, the investment will exceed U\$ 1 billion, intending to fix 9,000 people, from researchers to the team of support.

As all clusters of success, it has a unique and fundamental concentration of human capital of special talent: it is evaluated in about 250 thousand people the number of on investigators and technicians on the sector of the biotechnology in this region of California and the annual budget in development and research is U\$ 2 billion.

It is treated, as almost always in the urban-economic redevelopment process in US, of a classic case of public-private partnership, where the private companies since early actively participate on the development of all project. In this in case, there is a strong private investment of the sector of biotechnology and advanced research in a region that has decades of tradition in its participation in the new economy and in the sector of high technology.ⁱⁱ

In other words, the Bay Area nowadays sees the appearance of a new generation of clusters: the biotech ones.

Particularly the city of San Francisco nowadays longs to lead the race of the biotech-economy that started here with the thundering effect of the discoveries around the human genome that involved partnerships between the universities of San Francisco, Berkeley, Stanford and San Jose and diverse private laboratories. In the last years, this race has spread for some cities of California and U.S.A.: San Diego and Seattle, for example, also concentrate important clusters of biotechnology that, as here, have been propeller spring



San Francisco Mission Bay urban Project. Font: <http://pub.ucsf.edu/missionbay/imagedb/>



San Francisco Mission Bay urban Project. Font: <http://pub.ucsf.edu/missionbay/imagedb/>

of ample processes of productive restructuring with important consequences in its projects of urban regeneration.ⁱⁱⁱ

Urbanistically, also must be remembered that this is the last bigger of a series of urban regeneration projects in San Francisco. The process has looked for to rehabilitation of diverse old industrial buildings and wharf sheds, a process that already had been initiated with the urban regeneration project in Fisherman's Wharf and Embarcadero areas, as well as the Ferry Terminal Building recycling and the interventions of South of Market and Yerba Buena Center.

The Mission Bay project has began in the 80's, when the Santa Fe Pacific Realty Corporation, company of railroad transports, proprietor of Mission Bay, accepted the possibility of participation of the local community in the elaboration of an urban project for the region. After some significant changes in the type of predominant use for the area, and with the public competition of projects cancelled, the final proposal was effectively concluded in 1998, being developed by Johnson Fain Architects, of Los Angeles and counting on the contribution of Simon Martin-Vegue, Winkelstein & Moris, landscape designers, of San Francisco.

After that, in 1997, the UCSF promoted its proper international competition of architecture and urban design for the elaboration of the new campus that would occupy half of the all area of Mission Bay. Five finalists had been chosen, of authorship of Shin Takamatsu; Machado & Silvetti; Solomon; Steven Holl and Harvgreaves; STUDIOS Architecture and SWA. The winning project is of Axe, Silvetti & Associates, important office of Boston, with partnership of local architects Gordon H. Chong & Partners and Olin Partnership landscape designers that had developed the already inaugurated linear park of Mission Creek besides the new San Francisco Giants Baseball Stadium, in the edge of the area. The Pacific Bell Park, inaugurated in 2000, was an important instrument in the renewal process of the region. The localization of the stadium guaranteed attractiveness and a new option of leisure for the local community.

Two basic elements in the development of urban projects of this nature are infrastructure and accessibility. As in the majority of the cases, the public sector provided both. An underground infrastructure net, including ultramodern fiber optics and cables, has been implemented.

New accesses had been created binding the territory to the downtown and new lines of public transport had also been made. The greater innovation in this aspect was the high investment in the public transport on tracks, through the extension of the line of surface metro - MUNI - that started to connect the region with the financial district of the city. Mission Bay now is now served by MUNI, new lines of bus and a new station of train, Cal-Train



San Francisco Mission Bay urban Project. Font: <http://pub.ucsf.edu/missionbay/imagedb/>



San Francisco Mission Bay urban Project. Font: <http://pub.ucsf.edu/missionbay/imagedb/>

Station, that establishes connection to the Silicon Valley. Most interesting, however, it is the reutilization of the original railroad track passing on the corridor of the Third Street and crossing the entire territory of Mission Bay.

Sao Paulo: "glocal" city

This is an inquiry on some aspects concerning the incredible contradictions that are nowadays placed in the territory of Sao Paulo – the urban mutations – and also a discussion of some urban projects that work on these new challenges presented on the contemporary city. These urban projects work on the bordering conditions of the fragmented metropolitan territory: urban voids, wastelands, brownfields, *terrain vague*.^{iv}

These strong mutations emerged in the post-industrial city, more emphatically after the restructuring of the spatial economy on the last decades. The industrial decline generated the emptiness of whole urban areas. The metropolitan territory became depository of huge transformations and wasting became particularly evident on the urban fabric today: underused industrial zones, warehouses and industrial yards; abandoned central buildings; storage yards; railroad corridors and rail yards.

The presented urban projects were developed on the railroad corridor of Sao Paulo within all these territorial fragments and they work in close relation within the discussed concepts.

In this sense, a brief analysis about the territorial transformation process of the metropolis of Sao Paulo is also presented through some comments, numbers and images: an overview of the territory under mutation, a panorama of the fragmented and contradictory metropolis.

Sao Paulo Mutations

Numbers

Population	17 million
Area	1.509 km ²
Density	11,600 persons per km ²
Contribution to GNP	45%
% of Brazilian total population	10,5%
Population growing	0.5% per annum (5% during the 70's)
Population in 1900	0,2 million (grew 27,000% in 100 years)
Population estimate 2015	20.7 millions



The fragmented and mutant territory of Sao Paulo: railroad axis downtown and its wastelands.
 Font: Nelson Kon.

Urbanized area growing	40,000% in 100 years
% population living in favelas (shantytowns)	20% (1.3% in 1973)
Metro network	49.5 km (3.5 million passengers daily)
Rail network	270 km
Bus transport	11,000 units (3.5 million passengers daily)
Number of cars	5.1 million
Murder rate	35 per 100.000

Sao Paulo is nowadays a paradigm of the local metropolis in the global world. At just one time, a global city linked within the global network and a local city, where the banal space manifests itself as unfair and disqualified. It is, then, depository of an urban territory that faithfully portrays, with all contradictions of our time, the contemporary society: a "glocal city".^v

We live in the accelerated transformation age. The territorial dynamics have never been so dramatically realized in the history of our cities. Architecture introduces itself in this context suffering mutations in all scales. The metropolis materializes in its fragmented territory the rupture and the urbanity lack.

The consequences of the post-industrial metropolis quickly transformations are several, heterogeneous and complexes. Disqualified spaces emerge in the city, old productive areas are waste: wastelands and urban dysfunctions appear.

Then, the architectural transformations are present in the territory scope and vice-versa^{vi}.

Functions, uses and spaces have been transformed in the metropolitan territory through a dynamic and unexpected way. The perennial leaves for the transitory.^{vii}

Historical configured environments loose their functions. Historical centres become exhausted. Industrial territories seem, suddenly, disqualified. Whole urban blocks are object of speculation into transformation.

Forgetful spaces receive real estate development impulse. Luxurious residential areas emerge in the middle of the depreciated peripheries like the closed islands of walled villas in the midst of a territory without any kind of urbanity sense. Anti-cities – closed cities – emerge in between the fragmented territory.

Environments under special protection are occupied and re-urbanized. The illegal city is added to the legal city: shantytowns appear on the mountains, hills and around lakes areas. The urban

legislation is obliged to run after of the illegal reality: again, emerge the urban mutations.

At the same time, society gets into the New Century with a strong preoccupation about the environment preservation and about the recycle of the existing sources, natural and energetic. The environment transformation – on the territory and on the building scales – puts itself, therefore, inside this new demand: the sustainable development. It is more intelligent the transformation of the existing and non-used spaces instead of its substitution or denial.

In the city scope, we live the transformation moment of the existing territory, its restoration. Differently from other times, where the city transformation generated an urban renewal process under strong imposition (the *tabula rasa* prototype process) or the revitalization of historic centres into a fake urban scenario (the post-modernism prototypes of the 70's and the 80's), we have now a much more complex and rich situation.

Could the accelerated territory transformation be faced with local actions? In this sense, could the urban design still assist the rescuing process of huge deteriorated areas without creating scenic simulacrums?

On the other side, could the urban project be configured as an instrument to face the fragmented and disarticulated territory of immeasurable scale?

Finally: how could the urban project places itself facing the urban emptiness – the urban voids – without configuring itself as an oppression instrument, but first, as a real possibility of territorial rearticulating?

Sao Paulo railroad brownfield urban regeneration and productive restructuring experimental project

The new dimensions that lie in this territory – the fragmentation, the retails, the de-articulation (the un-articulated territory), the wastelands, the fluidity and the flows' network – are all presented at the territory of the railroad axis in Sao Paulo.

With the emptiness of the industrial occupation, the railroad loses very of its function. The lack of incentive to the railroad while a system of efficient and integrated public transport connected to the metro system, decisively corroborated for its emptiness of importance.

Its decay in the last decades also represents the spatial dereliction of its borders. A fragmented and deprived of characteristics territory was generated. The structures that had defined its



Wastelands at the railroad axis in central area Sao Paulo. 60% of Brás – an old industrial neighbourhood – is estimated empty or under-used. Font: Nelson Kon.



Typical terrain vague at the railroad axis, Brás neighborhood. Font: Nelson Kon.

occupation and consolidation today represent its obsolescence: the wastelands.

The architecture on the contemporary metropolis must have the plasticity that allows it to absorb the net of flows, the wastelands, and the new dynamics present in the disarticulated territory. Formal plasticity and programmatic flexibility are imperious in the contemporary urbanism.^{viii}

The urban discontinuities and territorial fragments offer a new possibility of urban project: the construction of a new metropolitan territoriality.

The metropolitan residual areas should contain the new urban projects and should articulate the new territory spaces. The void spaces operate as a potential instrument for the construction of the new public space.

In this sense, we can think of the presence of the void in the urban fabric as a fundamental parameter on the contemporary dynamics in opposition to the common idea of the redevelopment of the wastelands in central metropolitan areas within a massive architecture presence. Sao Paulo needs an *architectonic silence* in opposition to the grey and dense built masse. The new program should appear just on the borders, facing the silence. The minimal.

It is launched, then, an intervention strategy for a stretch of the railroad: a linear axis of 12.6 km extension.

It is established a dynamic urbanism through the urban matrixes system: four complementary urban matrixes that open the possibility of multiple designs through its many combinations. A new urban strategy, more flexible to the demands and the multiple programs of the contemporary metropolis. It is changeable in time and space. After all, the idea is about the establishment of an urban strategy that prepares the conditions for the construction of the territory. It prepares the territory to receive, coherently, the diverse urban programs and architectural elements, without, however, defining the final architectural forms.

The four urban matrixes are:

1. Infrastructures:

It is configured for the reuse of the existing infrastructures and the optimisation of the existing field conditions: modernization of the railroad system and its transformation into a surface metro system; modernization of the existing stations and creation of new ones; reactivation of the non-used patrimony; recycling of the industrial areas into a new technological basis industry (industrial/services clusters and technopoles).



The railroad axis urban project, by Carlos Leite, is based on the strategy of four matrixes superposition in time/space: infrastructure; flows; green axis; urban borders.
[http://www.educatorium.com/leitebrooke/LBAA_projetos.htm]



The project implementation within the green axis on the central void and housing and urban clusters on the borders



A view of the Brás area redevelopment showing the new infrastructural connections, the forest, the bordering housing and the proposed industrial cluster on the terrain vague (in orange)

2. Flows:

It is configured through the combination of projects for the transports system – road, pedestrians and collective – which results in the flows optimisation in the metropolitan axle.

3. Green axis:

Throughout all territory, together to the railway line, appears a green axis, a linear metropolitan park, whose final image constitutes a green gradient that varies of density from the central body forest to its dilution in the territory: an urban forest.

4. Urban borders:

The consolidation of the great metropolitan public axle – the railroad axis as integrator of public activities mainly – will be possible within the implementation of the complementary program on the bordering territories: programmatic elements that respond to the forces of the surrounding neighbourhoods.

It is proposed the implementation of collective housing: affordable housing is an essential parameter on the process of reclaiming and renewing metropolitan wastelands.

It is proposed a whole process of reindustrialization of some specific and huge urban voids – the typical brownfields: under a productive restructuring process based on local redevelopment characteristics it is possible to implement a linear system of connected high tech clusters that works as urban catalytic elements.

Arguments

The basic question that we raised was concerning the possibility of these innovative environments to operate positive transformations in the new strategies of urban regeneration processes.

We stopped, for a while, our research in Sao Paulo in 2004 to take a closer look at the San Francisco Mission Bay project because of its similar problems and conditions^{ix}: the necessity of putting new productive functions as a basic condition on the strategy of urban regeneration of a huge wasteland.

The case studies are interesting as critical analysis and possible striking to our local reality when the analyzed problems are similar. The vocation of the territory – city and region – is the same: the productive historical vocation. It interests us, over all, the analysis of the problem and its strategy of regeneration, not the importation of models of urban design. It is obvious that the simple transportation of "international success models" is not enough for us. We always have to remember the huge obstacles for the local development in the perypherychal countries, in our urban

areas of low income and with risks of exclusion. The local reality conditions are basic for a correct and critic reading of the territory.

The importance of the rule of strategically planning is fundamental. The joint of the agencies of local planning, management publishes, agencies of public-private urban planning and partnerships are basic in the analyzed cases of success, but here in Brazil we are only initiating this process in our metropolis. The integrated planning within the political, technological, economic and urban dimensions can act as a facilitator of the new economic-territorial organization.

Innovation and technology: transport and accessibility and infrastructure are prerequisites to attract new enterprises. There area no innovative environment in the world without the strong presence in the territory of (a) good urban infrastructure and (b) accessibility of transport and traffic. These conditions were developed before the new urban fabric appearance in San Francisco Mission Bay. But, again, in Brazil, there is a strong problem concerning the continuity of the public budget for specific projects because of the politics and absence of public dimension.

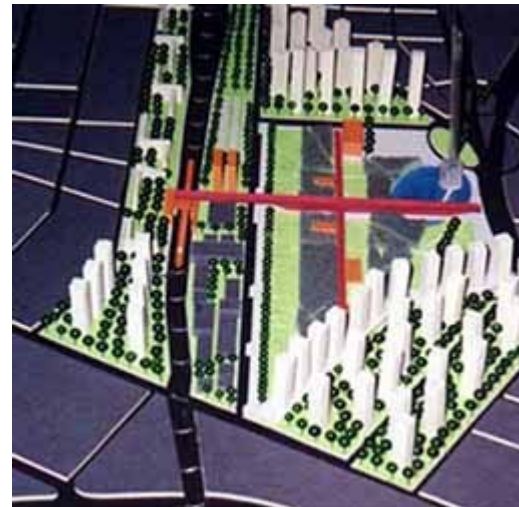
Innovation and human capital. The cases disclose, without exception, the strong presence of generating elements of specialized human capital, "of talent": universities and institutions of strong research. The more the territory has, it is better. Specializations could be highly favourable, as we can see in the huge researches conducted in 50 American cities by Richard Florida and, not by lucky, San Francisco in pointed out in the first place on his famous ranking of most creative cities^x. Concerning these aspects, Sao Paulo could be considered a favourable place, because of the presence of the main universities and research laboratories of the country. The problem is that we don not have the strategic view of its importance as strategic catalytic elements.

Innovative environments, productive restructuring and urban regeneration. Who is benefited in this new territory? Some questions that emerge immediately:

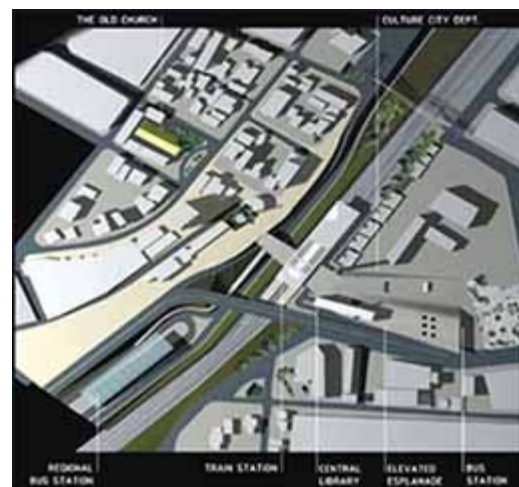
The economic development: new companies, more jobs? In the new economy, nor in such a way. Or, at least, the jobs and activities highly specialized in the beginning of the process predominate;

The local development: normally the revitalization of the bordering territory is verified. Positive side: re-appearance of spoiled or inexistent urban activities. Risk: radical transformation of the historical vocation of the fabric urban, also by the substantial increase of the price of the land;

Gentrification of the territory? Almost inevitable;



The typical terrain vague at Mooca were transformed into an urban park.



The Maua node.



"Elitization" of the innovative environment: the presence only of the specialized human capital, "of talent" predominates in the new territory;

Image of the place: risk of substantial transformation of the place because of the technological resources implementation. However, if the territory always had productive, industrial vocation, it is only about a "new language" for these same vocations urban fabric;

Informational environments: some studies have already suggested emphatically that, in contrast of the predominant common sense, the informational environment communication and interaction system are only complemented with the traditional physical interaction. In clusters innovative of success, it has enormous valuation of the interactive human capital. Innumerable clusters had only had success for account of the rich and unique exchange of information propitiated by the presence, in the same environment, of common activities.^{xi}

Therefore, it seems evident the unique rule of the metropolis in the new world-wide net of flows and innovative processes. The potential of the central territory regenerated and reorganized productively is immense in the new economy, since that strategically planned.

Under the prism of the sustainable urban development, to come back to grow toward inside the metropolis and not to expand it is another highly excellent aspect in these cases: to recycle the territory is more intelligent of than to substitute it. To reorganize it productively is possible and desirable in the metropolitan strategically planning.

In other words: productively regeneration of existing metropolitan territories must be the other face of the same coin of the new processes of economic and technological innovation.

Finally, despite of the enormous potential existing in Brazilian metropolises as Sao Paulo, we must still remember our immense local, inherent difficulties to a country in development process. Here, we cannot only demand the infrastructure and accessibility installations, for example, without before facing the challenges of abilities accumulation and of the construction of an ample social process that stimulates the local development.

If our metropolis can generate efficiency, diversity and innovation, it will be from proper models, which does not exclude, however, a process of cross-critical learning with the international and pioneering cases. Metropolis like Sao Paulo must urgently define its (enormous) paper in XXI Century. After all, as it is known, the future is not something that simply happens, but is created by us.

Notes

ⁱ HALL, Peter. *The Generation of Innovative Milieux. An Essay in Theoretical Synthesis*. IURD Working Paper #505. Berkeley: IURD/UC Berkeley.

ⁱⁱ SAXENIAM, AnnaLee. *Regional Advantage. Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press, 1996.

ⁱⁱⁱ See, e.g. the seminal works of:

SPERLING, John. *The Great Divide: Retro vs. Metro America*. Nova York, Polipoint, 2004;

FLORIDA, R; GATES, Gary. *Technology and Tolerance: The Importance of Diversity to High-technology Growth*. Washington DC: Center on Urban & Metropolitan Policy, The Brookings Institution, 2001;

JACOBS, Jane. *Cities and the Wealth of Nations*. Nova Iorque, Random House, 1984

^{iv} To describe these kind of residual spaces presented on the metropolitan territory, the authors have used many different words. The definition of wasteland in its French origin, *terrain vague*, comes with accuracy in a text, currently classic, of the Catalan architect Ignasi de Solà-Morales under a cultural context: an area without clear boundaries, without current use, vague, of hard understanding on the collective citizens perception, constituting normally a tear in the urban fabric. But is also an available area, full of expectations, with strong urban memory, potentially unique, the space of the possible, of the future (SOLÀ-MORALES, Ignasi. *Terrain Vague* in: *Anyplace*, 118-123: Cambridge: MIT/Any, 1995.). The term *urban void* is quite used by many European authors and specially by the Dutch Architects (KOOLHAAS, Rem. Apud GUST. *The urban condition: space, community, and self in the contemporary metropolis*. Rotterdam: 010 Publishers, 1999.). In USA, the concepts of *wastelands* and, mainly, *brownfields* are more often used: "Often called "brownfields," in contrast to "greenfields" at the urban edge, industrial wastelands comprise 5-10% of the metropolitan land area. It is estimated that there are at least 400,000 brownfield sites in the US, especially in the Midwest and Northeast. These are often situated within declining districts that have aging streets and other infrastructure. Their locations may be perceived as marginal, and they may be contaminated by decades of industrial use." (SOUTHWORTH, Michael. *Wastelands in the evolving metropolis*. Berkeley: IURD/UC Berkeley, 2001, p. 8). Under an American approach, lots of information could be found at the Brownfield Source Organization (www2.brownfieldsource.org). Finally, it is interesting to see the pioneer approach developed by Kevin Lynch in 1981 (LYNCH, Kevin. *Wasting away*. San Francisco: Sierra Club, 1981).

^v SASKIA, Sassen. Scale and Span in Global Digital Word. In *Anything*, 44-48: Cambridge: MIT/Any, 2001 and RECAMÁN, Luis. New and Old Conflicts in Sao Paulo's Urban (Dis) Order. In VRIERS, G. W. (org.) *The global city and the territory: history, theory, critique*. Eindhoven: TU/e, 2001.

^{vi} SANTOS, Milton. *O país distorcido: o Brasil, a globalização e a cidadania*. São Paulo: Plubifolha, 2002.

^{vii} PEIXOTO, Nelson Brissac. *Arte/Cidade: Grupo de Intervenções Urbanas: Brasmitte: São Paulo, Berlim*. <www.uol.com.br/artecidade/cdf.htm>. Accessed in 30.08.2000.

^{viii} ALLEN, Stan. *Points and lines: diagrams and projects for the city*. Nova Iorque: Princeton Architectural Press. 1999.

^{ix} We were in Califórnia from August to December 2004, conducting our case-study reearch as part of our postdoctoral program at the Cal Poly University.

^x FLORIDA, Richard. In: *The Next American City. The Great Creative Class Debate*. The Next American City, Special Feature, #5, pp. i-viii. Nova Iorque: The Next American City, Inc., 2004.

^{xi} See, e.g.:

Porter, Michael. *The Economic Performance of Regions: Measuring the Role of Clusters*. Gotemburgo: The Competitiveness Institute, 2003;

SIMMIE, J. (Ed.) *Innovative Cities*. Londres. Routledge, 2001.

Carlos Leite

cleite@educatorium.com www.leitebrooke.com.br/leite_clusters_1.html