S.O.U.P. – Sustainable Operative Urban Principles

by

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ABSTRACT

World population is dramatically increasing. Many cities around the world will reach a critical mass that will turn them into metropolis. Moreover, recent analysis on California demographic trend has shown that that region is expected to grow by 12 millions over the next 20 years. Although California will be the fastest growing area in the U.S., almost any region in North America is expected to follow a similar pattern. Nonetheless, infillings and redevelopments will cover just the 30% of that housing request, while the remaining 70% will require the creation of new settlements.[1] The idea of urbanising undeveloped land is not based on opinions but necessities.

At the same time, issues of globalization, distribution network, etc. are redefining economically and socially the concept of city in the late-capitalist market. In spite of these tendencies which could best be described as unpredictable and highly dynamic, architecture and urban planning alike continue to adopt models that ignore these mutations. History, identity and local culture are the misunderstood principles inspiring projects whose coherence exists only on paper. In fact, these blueprints often clash with actual issues of speed, demographic change and market forces resulting in either nostalgic or megalomaniac proposals.

S.O.U.P., the product of this research, is an *interdisciplinary* tool to design in such conditions of in extreme *speed* and *uncertainty*. It consists in a redefinition of the traditional urban planner's toolbox through a series of diagrams and methods that aim to obtain a dynamic, responsive and ultimately sustainable notion of urban plan. To do so the research is based on the assumption that only by shifting from a problem-driven attitude to a problem-driven approach will urban planning regain its experimental character and thus be able to meaningfully participate to the city-making process.

Although the conditions just described can be traced in many contexts, a site in Vancouver was singled out. In fact, the former Finning site, soon to be developed by the four main academic institutions in Vancouver (UBC, SFU, BCIT and ECIAD), represents a perfect testing ground since it is characterised by several of the issues discussed.

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[1] Peter, Calthorpe. "The Urban Network: A Radical Proposal". APA - American Planning Associacion (journal on-line); available from http://www.planning.org; Internet; accessed 6 June 2002.

Under such conditions two main paradigms must be dismissed. The disastrous tendency that urban planning has to go from *many* to *one* must be replaced by a system that will keep opportunities open, a field condition which will go from *many* to *many.* This particular shift can only occur if simultaneously we move from a problem-solving attitude to a problem-driven approach without limiting the outcome of the research. Therefore, **S.O.U.P.** is not an algorithm to mechanically produce Campuses, it is rather both a mediator and a facilitator to systematize and refine questions regarding the design of a Campus. Perhaps, a viable approach might be one where responsiveness replaces determinism and control and openendness come to coexist.

Therefore, S.O.U.P. can be defined as a system based on rigorous rules that gives rise to unpredictable results, a system that in short time can react to and shape the traditional debate occurring during the preparation of an urban design.

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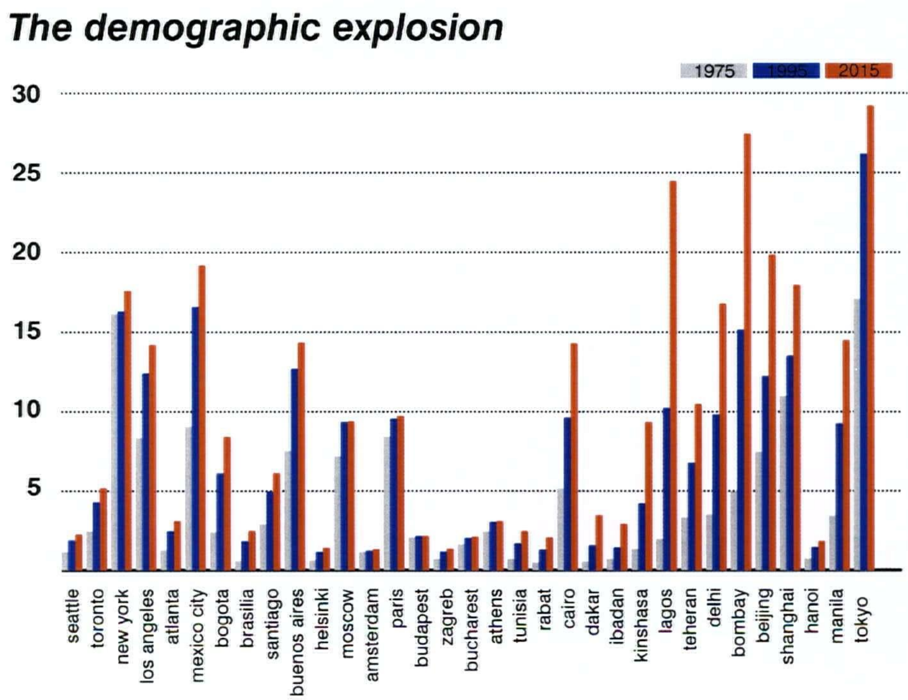
Particularly, I would like to thank Oliver Lang for his continuous and outstanding support throughout the whole program. He not only taught me how architecture can embody and possibly enhance cultural practice, but he also explained me what researching means in our field by letting me explore, attempt and sometime fail. His lesson has certainly been invaluable.

Most importantly, I would like to thank Stefania, my wife, for her immense help. The outcome of the thesis was very much based on the daily discussions we had about architecture and its link to every facet of life. She supported me when I was down; she shared with me the moments of excitement after any major achievement and provided me with constant challenges to any idea I came up with. She taught me that "non hai dato tutto se non hai dato ancor" (if you haven't given it your all, you haven't given enough).

Finally, I would like to thank any professor, staff member and student that was in anyway involved in this research.

INTRODUCTION: WHY

World population is dramatically increasing. Many cities around the world will reach a critical mass that will turn them into metropolis, among them there is Vancouver that has been expanding at the average 7% growth-rate per year. Moreover, recent analysis on California demographic trend has shown that that region is expected to grow by 12 millions over the next 20 years. Although California will be the fastest growing area in the U.S., almost any region in North America is expected to follow a similar pattern. Nonetheless, infillings and redevelopments will cover just the 30% of that housing request, while the remaining 70% will require the creation of new settlements.[1] The idea of urbanising undeveloped land is not based on opinions but rather on necessities.



Source: Global Urban Observatory

Fig. 1.1 – *Population trends in the major metropolitan centres in the world.*

[1] Peter, Calthorpe. "The Urban Network: A Radical Proposal". *APA – American Planning Associacion* [journal on-line]; available from http://www.planning.org; Internet; accessed 6 June 2002.

It is by now clear that global forces are reshaping both the notion of urban space and its future importance.

In recent years we have seen a series of propositions that attempted to resuscitate developmental models that belonged to a remote past. For example's, Renzo Piano's plan for Potzdamer Plaz in Berlin was inspired by the old 19th century housing development. By anchoring his proposal to a formal device extracted by history, Piano's plan misses to both capture and enhance the character of the contemporary life in Berlin.

On the other hand, the blast of the Aladin in Las Vegas marked the 7th resort in the last 8 years that was transformed into rubble. The strategy for reconfiguring the city is quite straightforward in its radicalism: what is obsolete is literally torn down to make room for a new state-of-art resort.

In spite of this data, architecture and urban planning keep adopting models that ignore these changes. History, identity, local cultures are the principles inspiring projects whose coherence exists only on paper. In fact, these outcomes often clash with issues of speed, demographic change, market forces resulting in either nostalgic or megalomaniac proposals.

Fig.1.2 - The implosion of the Aladin Resort in Las Vegas.

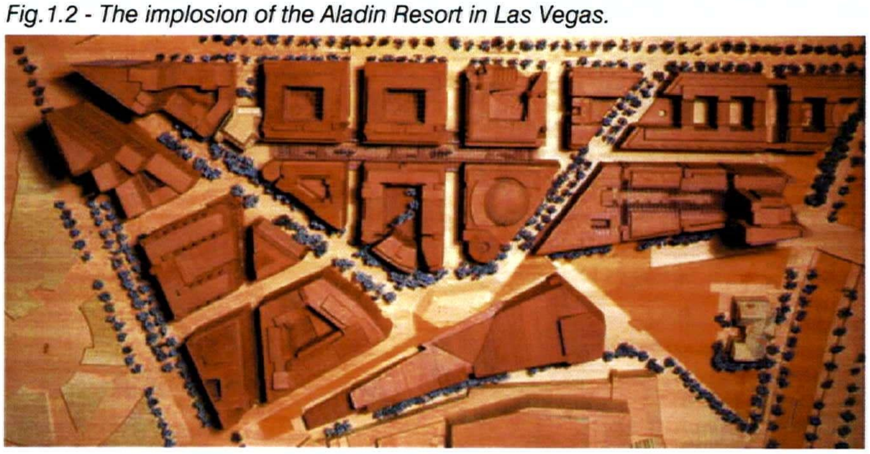


Fig.1.3 - Renzo Piano. Masterplan for Potzdamer Platz, Berlin, 1996.

On the other hand, an alternative type of urban space has been surfacing as well. This is a space in which several events can coexist despite the apparent contradictions among themselves. The interest of projects such as Jon Jerde's Freemont Experience in Las Vegas (fig.4) does not rely in the beauty of the piece of architecture itself, that is to say that the different behaviours occurring under one gigantic roof cannot be grasped completely by an analysis of the physical qualities of the space only.

Characterized as such, urban design has more to do with the notion of **organization** and ultimately **infrastructure** rather than questions of style or tradition.

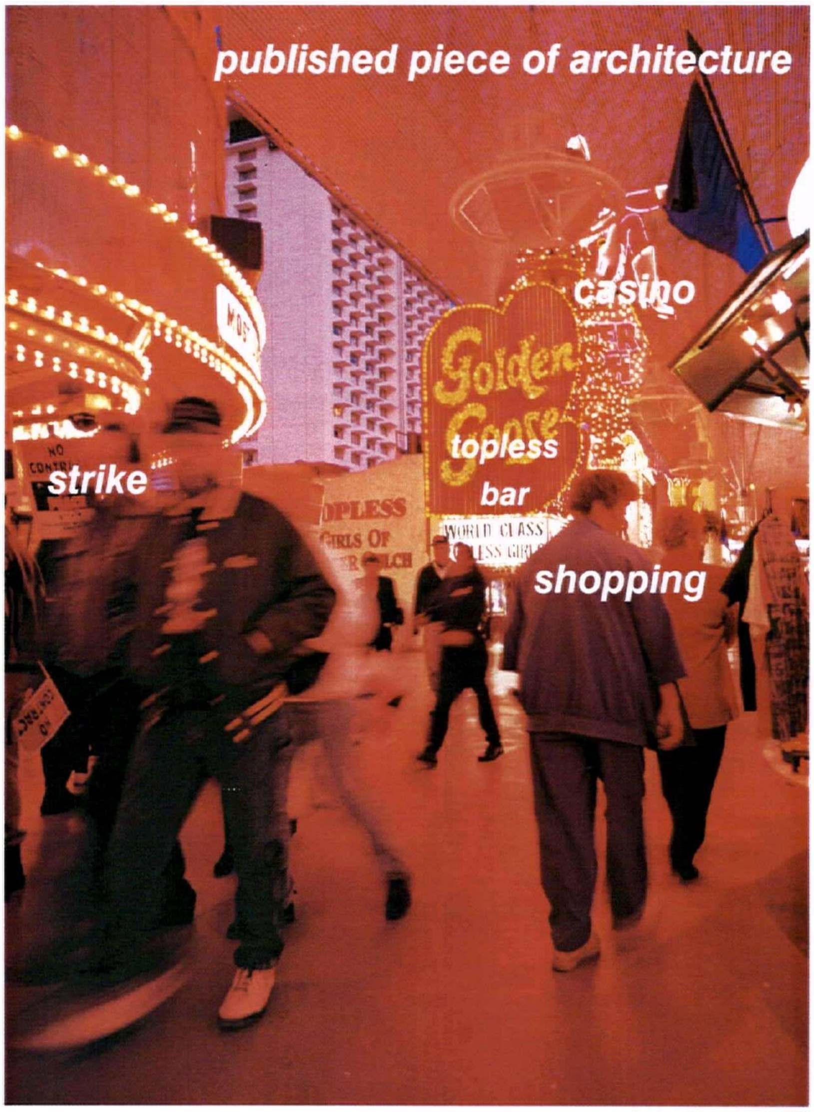


Fig.1.4 - J. Jerde, Freemont Experience, Las Vegas, USA, 1995.

However, what is infrastructure and how has it changed over the past 30 years? Sanford Kwinter describes it as the very DNA of cities: "by infrastructure one refers to every aspect of the technology of the rational administration that routines, life, action and property within larger (ultimately global) organizations."[2]

At the same time, he old paradigm of infrastructures laid out according to basic geometric principles such as grids – as in the case of the American power system or Land Ordinance Act of 1785 in which the Americans laid a grid onto the whole country from Pennsylvania to California – has evolved towards much more complex infrastructural systems. In this map of the computer servers in the United States we can observe a phenomenon that we can call *decentralization*. With the advent of the electronic commerce, for example, it is possible to bank by computer, trade stocks via Internet and so on. This has resulted both in increased mobility and changed concept of space which has blurred the boundaries of the city. The new kind of city is no longer fixed, but is becoming more fluid and most importantly characterized by an organizational principle based on clustering groups of elements rather then spreading them out evenly.

In the map designed by OMA in 1996 for the masterplan of a new transportation hub in Lille, France (fig.5), it is possible to evaluate the political consequences that a new type of organization gives rise to. This diagram illustrates the distance in time between the French city and the rest of Europe. Two main elements signals a radical shift in the evolution of this landscape: first, no difference exists between land and sea in terms of means of transportation, second, it emerges a different outline of Europe, one that potentially clashes with the official limits of the continent.

However, what does cluster really mean and what instances can be brought up to exemplify it.

[2] Sandford Kwinter and others, eds., *MUTATIONS*. (Bordeaux : ACTAR, 2000), 495.

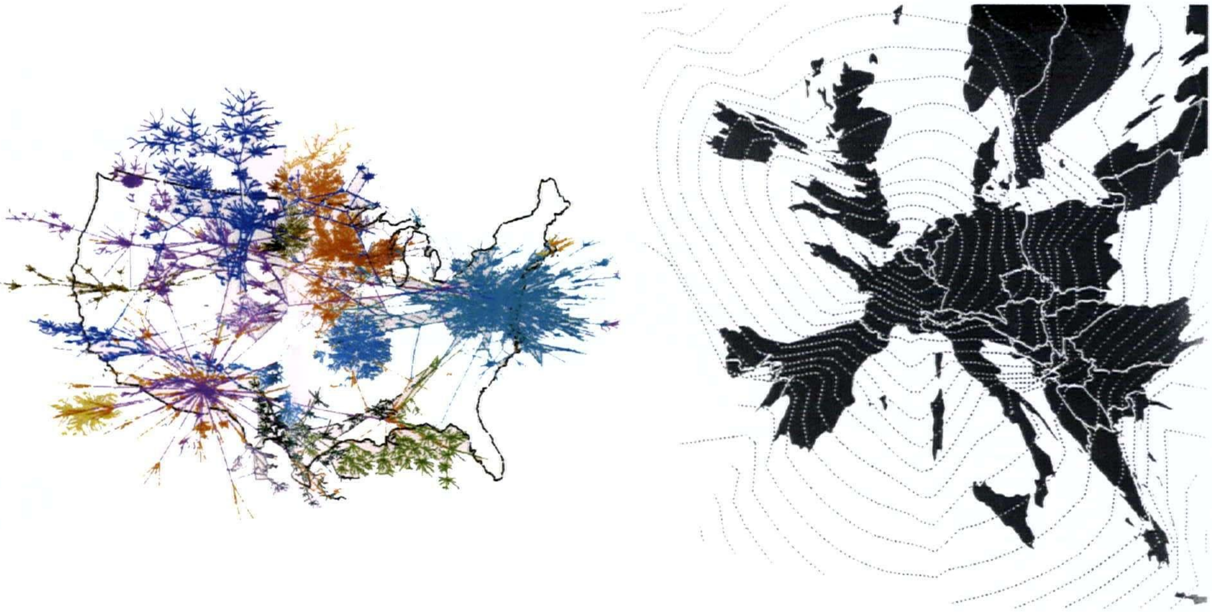


Fig.1.5 – On the left: map of the server computers in the United States. Source: Mutation. On the right: OMA, Euralille, Lille, France, 1996. Source: S,M,L,X-L.

The fruit network which daily distributes food all over the world represents a good example of the complexity and precision of current infrastructures. On a global scale we can notice that a vast network exists to feed cities; to grow, distribute and deliver food that people cannot grow their own. Every step in this journey involves a different form of transport, a new layer of packaging or type of container , another place where the goods can be chilled, stored, packed and eventually sent off again to the next station. Prices are negotiated, assessed, orders are placed and deliveries and made. This intricate network is not controlled by governments or official bodies, but is made up of many private businesses and individuals. If the network came crashing down, the world's major cities would find themselves short of food within a matter of days. Again, this system is not based on a linear grid but rather clusters.

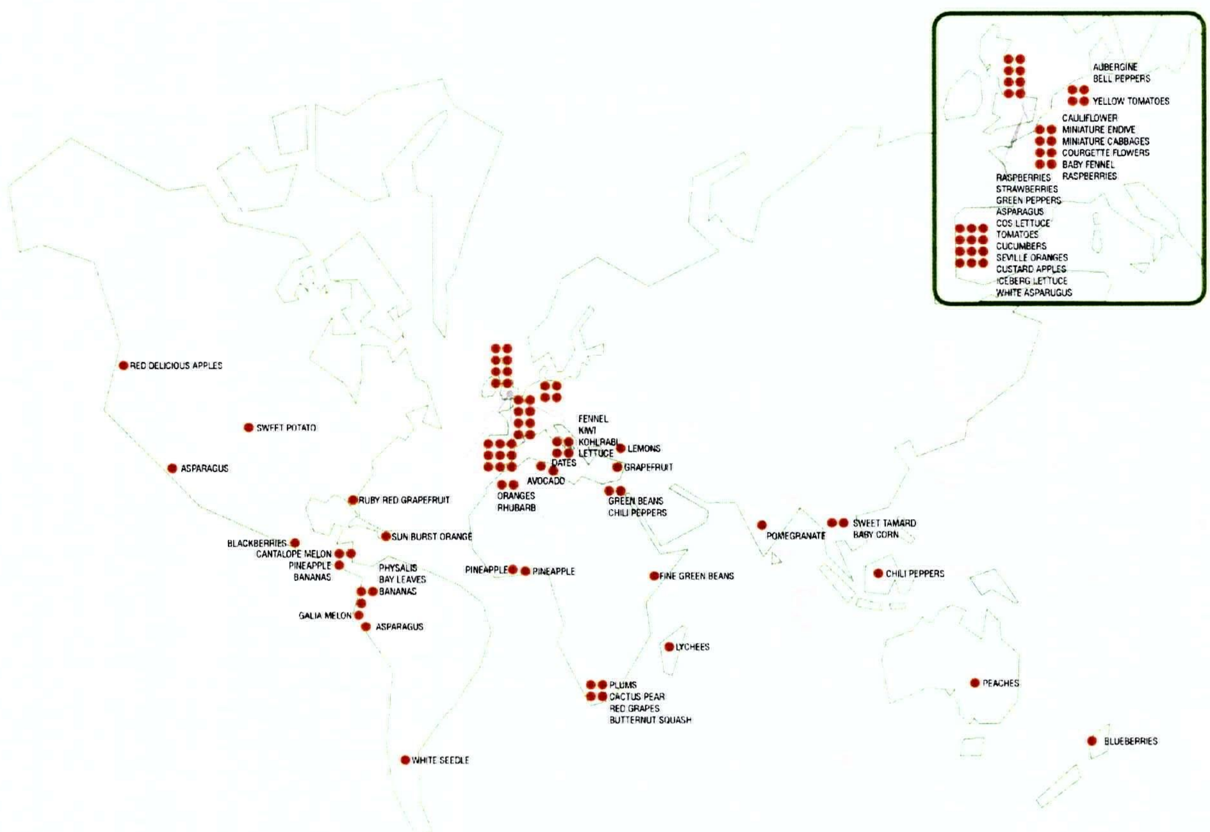


Fig.1.6 - *Products available at New Covent Garden Market on 7 March 2000. Source: Alex Stetter, "Goods", in Breathing Cities (London: August),2000.*

Even by shifting from a global analysis to a local condition, we can observe the reoccurrence of similar organizational types. For instance, clusters are still present as main economic strategies both in the global and local business. Many industries have been forced to construct alliances in order to keep up with the vanishing of borders and the consequently reorganization of local economies. These partnerships operate in a complex way. Clustering acts upon the regional configuration of the territory. Althought regionalism has often been associated with a conservative politic , in this case it rather responds to the increased demand of specialization that global markets are paradoxically requiring. What emerges is a new definition of regionalism that no longer means protectionism but rather difference and dialogue among different agents.

Moreover the spatial layout of cities reiterates the idea that decentralization has been replacing compactness of the prototypical European city. For example, the infrastructure that delivers fruit in Vancouver is strategically located at any intersection between heterogeneous systems of communication. Borders, international airports, docks for shipping containers are the nodal points that materialize globalization as a carefully planned discontinuity in the landscape. This gives rise to a coexistence among elements that dialogue with completely different scales. The traditional idea of scale which progresses from the smaller to the increasingly bigger is substituted by one characterized by constant jumps, shift and discontinuities between local and global components.

For instance, due to perishable nature of the commodity, this business heavily relies on Air Cargo. Therefore, different economies of scale are juxtaposed: on the one side, the local community constituted by small shops and, on the other, FedEx with 146,000 employs, 3,2 million parcels delivered daily and the second largest fleet in the world.

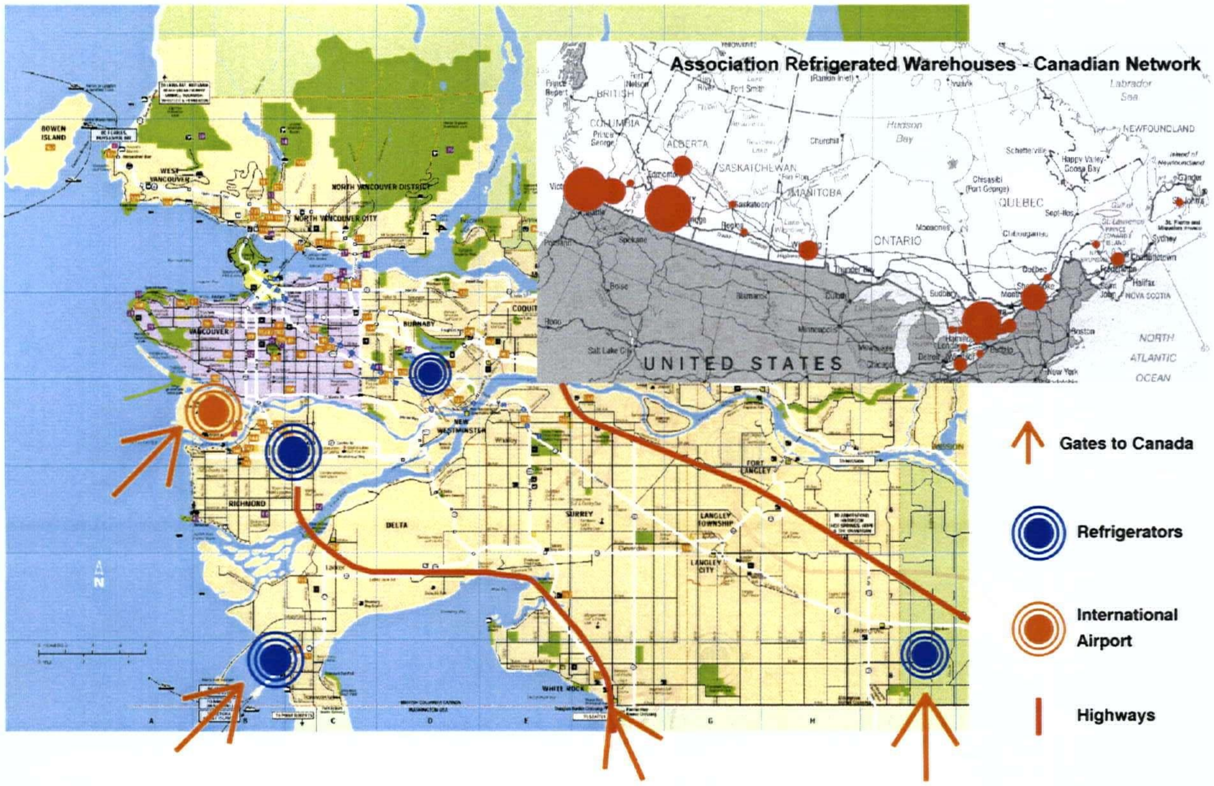


Fig.1.7 – Map of the cluster organization in the Greater Vancouver.

Food and perishable supplies in general, computer components and car industry are some of the sectors that share dependency on just-in-time delivery systems. The importance of these systems is so crucial that they are utilized to evaluate countries' economy. It immediately appears that a basic system for delivering goods has much more implications than supposed. This, along with others factors, is one of the nodal points in which a technological device interweaves economy and politic. Treaties, protocols, local conflicts, new railway constructions, regional downturns become all part of a larger network. Although these phenomena occur in areas far apart from each other, they produce effects that influence local territories in the most unpredictable and surprising manner.

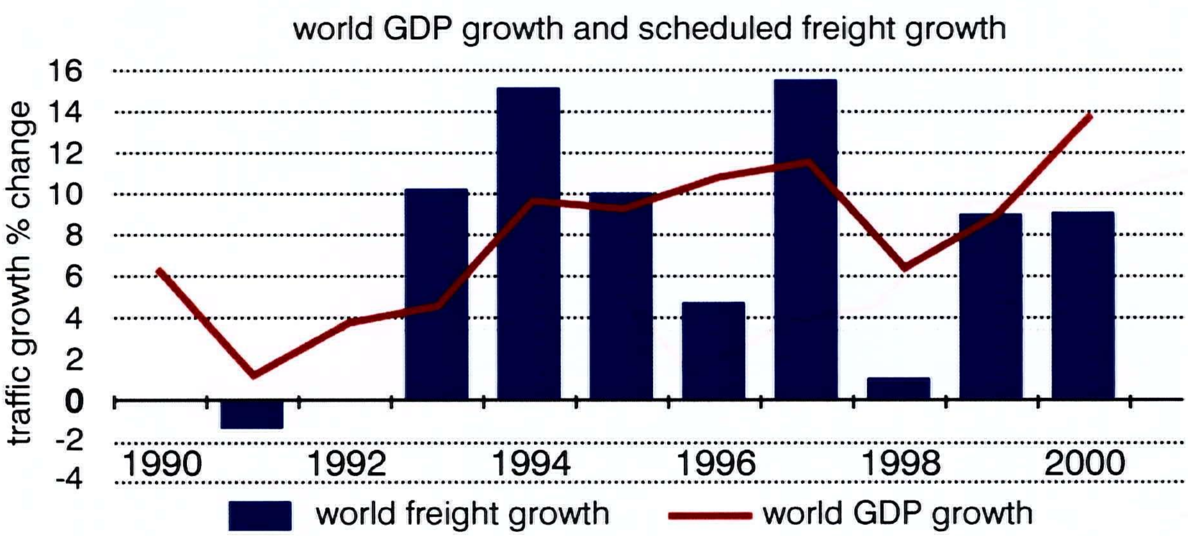


Fig.1.8 – Chart showing the relationship between freight and GDP growth. Source: IATA - International Air Transportation Association.

The same kind of organizational principles can be seen when we shift from purely economical systems to other types of organizations. For instance, the complex set of relationship that universities have deeply resembles the notion of cluster previously discussed. UBC entertains cultural and academic exchanges with 234 other post-secondary institutions scattered all over the world.

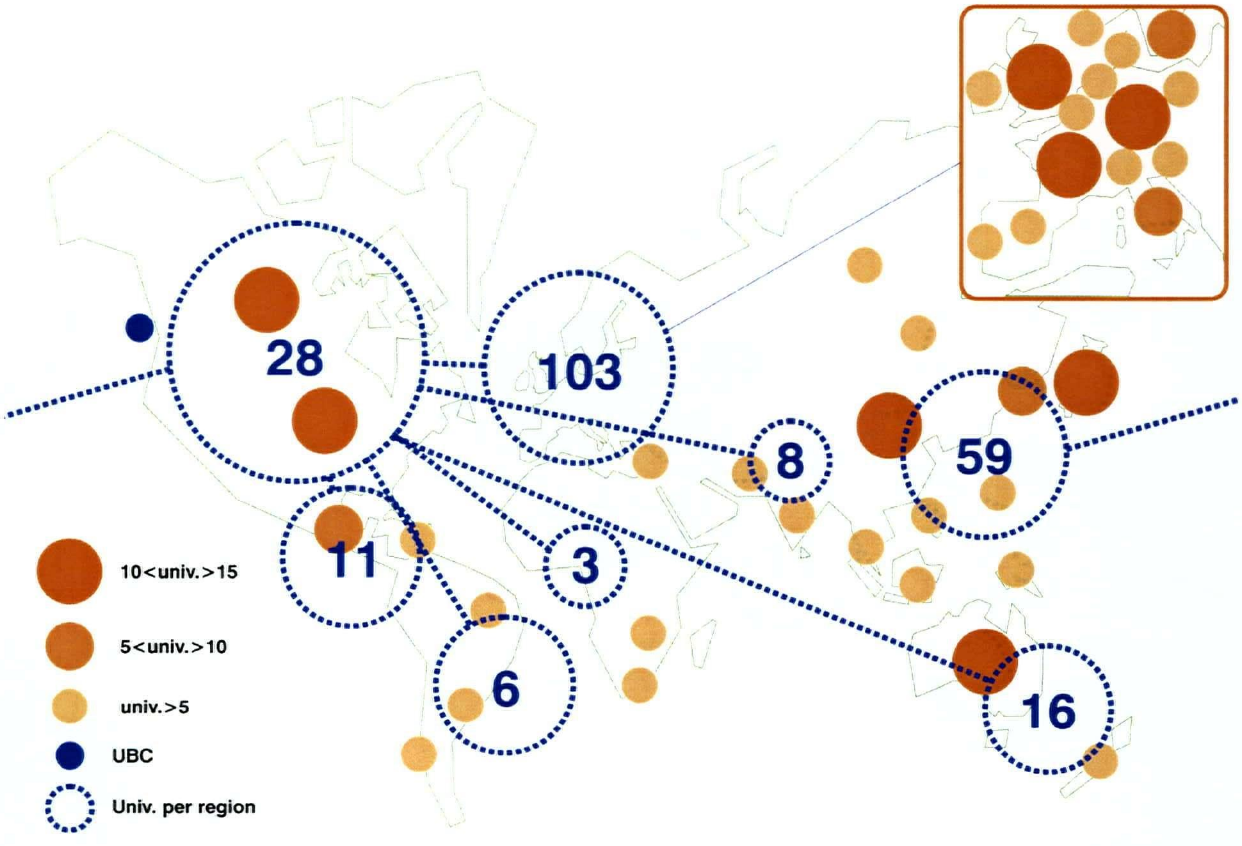
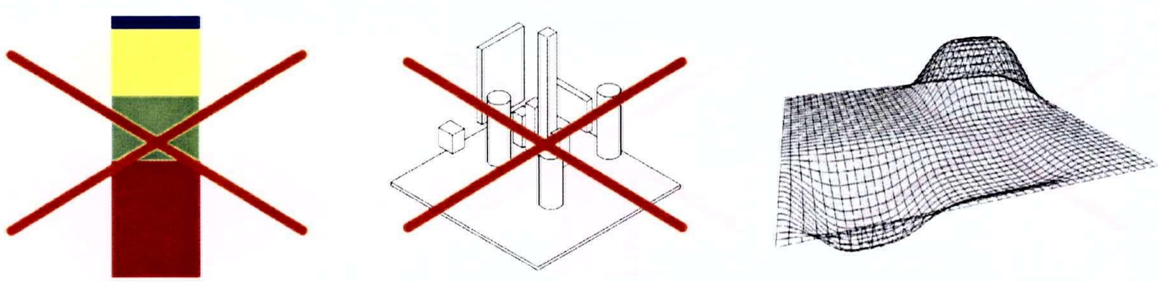


Fig.1.9 – Map of the existing relationships between UBC and other post-secondary institutions in the world. Source: UBC web-site.

INTEGRATED DIFFERENCE

The definition of infrastructure outlined so far is characterized by a series of determined elements: it is *dynamic*, *complex*, *adaptive* and *precise* in the sense that generates indeterminacy out of more specific analysis.

Three models were singled out to clarify the implication that organizational devices has been having in the architectural debate. First, the model labelled ***Determined Functional*** based on merely quantitative analysis, then the ***Generic Multifunctional*** model based on the idea that flexibility can only be achieved by decreasing the degree of precision of system. Finally, the proposed model called – ***Integrated Difference*** – which aims to represent a different paradigm for organizations. It is a system that compiles together several layers of information without losing specificity, it generates indeterminacy is not out of imprecision but rather out of more precision and thus more knowledge and finally and most importantly it is a system that turns quantitative inputs into qualitative outputs. As Gilles Deleuze put it:" The undertermined is not a simple imperfection in our knowledge or a lack in the object: it is a perfectly positive, objective structure which acts as focus or horizon within perception".[3]



determined functional — generic multifunctional — integrated difference

Fig.1.10 – Diagrams describing the three paradigms of the 20^{th}-Century city planning.

[3] Gilles Deleuze, *Difference and Repetition*. Minneapolis: University of Minnesota Press, 1990.p.169.

	S.O.U.P.	URBAN DESIGN
RESULTS\CULTURE	individualialization	Identity
	sustainable dynamic	sustainable static
	experimental	problem solving
PRINCIPLES	bottom-up	top-down
	content	formal
	operative	normative
	3D[4D]	2D
	responsive	deterministic
	interdisciplinary	disciplinary
TECHNIQUE	urban prototyping	masterplanning
	field	zoning

Fig.1.11 – Comparative study between S.O.U.P. and traditional urban planning.

INDIVIDUALIZATION

SUSTAINABLE DYNAMIC

Our cities are characterized by complex relationships between single/local elements and holistic/global factors. A model that wants to be operational must take into account both and be capable to relate different phenomena in a dynamic fashion.

EXPERIMENTAL

"Problem solving simply accepts the parameters of the problem given, in the case of architecture, by the client. Design is meant to work within these parameters until a solution to the problem is worked out, a final design.

Innovation...works by a different, more experimental logic where, by rigorous analysis, design opportunities are discovered that can be exploited and transformed into design innovations. While problem solving works within a given paradigm to create solutions to known problems, innovation risks working with existent but unknown conditions in order to discover opportunities that could not have been predicted in advance".[4]

Therefore, ***S.O.U.P.*** is a system to turn known phenomena into unknown and potentially innovative questions.

BOTTOM-UP

Innovation is deeply related to discovering unforeseen opportunities. These possibilities might not emerge if the technique utilized has a deterministic character, one that establishes limits and excludes possibilities from the outset. In order to be a bottom-up system, ***S.O.U.P.*** only fixes the rules of the game but then does not control results.

CONTENT

As Michel Foucault put forward "Technology must be social before it is technical."[5] The current set of tools and information that regulates urban planning fundamentally has technical and quantitative character; ***S.O.U.P.*** proposes techniques that allow urban design to be based on and affect the cultural landscape as well. In ***S.O.U.P*** quantity becomes quality.

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[4] M. Speaks, *Design Intelligence: or Thinking After the end of the Metaphysics*, AD, vol.72, n. 5 Sept/Oct 2002, p. 4-6.

[5] M. Foucault, The order of Things: an Archaeology of the Human Sciences. New York: Routledge, 1989, p. 82

OPERATIVE

Design is not a representation of a priori concepts. In order to be affective, these techniques must do away with representation. To do so, principles come to replace concepts. The result is an operative system.

3D

The abstract flatness of the traditional urban planning based on zoning is replaced by a methodology that studies space in its full nature and complexity. By using CAD-systems a temporal dimension is introduced. The study of space involves the fourth dimension as well.

RESPONSIVE

With ***S.O.U.P.*** responsiveness replaces flexibility. Whereas flexibility often implies a generic condition, a sort of imprecision, where multiple programs can occur, responsiveness proposes a series of principles to generate precise yet unforeseen results. As Gilles Deleuze wrote in *Difference and Repetition*: "the undetermined is not a simple imperfection in our knowledge or a lack in the object: it is a perfectly positive, objective structure which acts as a focus or horizon within perception."[6]

INTERDISCIPLINARY

New results can only be attained if the research is based on different assumptions. Therefore, not only does an interdisciplinary approach connect together the multiple forces shaping our cities, but it also provides a diverse scenario to work with.

S.O.U.P. is an INTERDISCIPLINARY tool that collocates itself at the threshold between urban planning and architecture. Where the former basically shapes the city by means of indexes and height restrictions the latter fundamentally focuses on objects as well as acts within given territories. By collapsing these two distinct realms together we not only rejoin two aspects of cities making that are artificially separated, but we also unleash the potential that these two discipline have when combined.

URBAN PROTOTYPING

The prototype, the simulation is the instrument by which ***S.O.U.P.*** experiments and ultimately innovates. The prototyping culture, as it has unfolded in the Corporate world over the last decade, materializes problems and other political and strategic issues in order to constantly formulate and then refine questions. As Micheal Schrage describes in *Serious play: how the world's best companies simulate to innovate* :" Prototypes and simulations can do

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[6] G.Deleuze, Difference and Repetition, Minneapolis: University of Minnesota Press, 1990, p.169.

more than answer questions; they can also raise questions that had never been asked before. Playing with a prototype can stimulate innovative questions as surely as it can suggest innovative answers. There are profound cultural differences between organizations that build prototypes primarily to create questions and those that do so to answer questions. The ratio of questions asked to questions created says a lot about the organization 's innovation culture."[7]

FIELD

The deterministic approach of current urban planning is characterized by a systematic tendency to go from *many* (i.e. many options, many types of information, etc.) to *one* (i.e. one solution, one set of indexes and so on). On the contrary, fields are often described as devices tracing the opposite trajectory: they go from *one* to *many*, form individual to collective, from objects to fields.

[7] M. Schrage, *Serious play: how the world's best companies simulate to innovate.* Boston: Harvard Business School Press, 2000, p.77.

CASE STUDY: GREAT NORTHERN WAY CAMPUS IN VANCOUVER.

Although the issue described have a global relevancy, a case study was single out. The GNW (Great Northern Way Campus) represents an unique opportunity to test how an experimental planning tool can be applied to an existing condition.

Many elements make this particular site a challenging one. First of all, this area will witness the construction of an university campus where the four mayor academic institutions in Vancouver will merge creating a hybrid based on each institution's main strengths. All the bodies involved are strongly committed to generating a space for innovation and exchange. Second, the programmatic mix that will be housed will be made up by: one third academic spaces, a third by either private associations or private companies and finally by residential spaces to be leased or to house students dormitories.

The complexity of the organization of the campus as well as the necessity to accommodate functions that have different nature asks for a new approach that can enhance the newness of such endeavour.

Finally, the recent history of this site, whose strategic location allows us to think of it as an urban piece, has been marked by series of failures. First the so-called Busby Plan which envisioned to turn the whole area into a high-tech park and then the Schroeder site located next to the railway station whose plans for another high-tech park failed to come true. Both plans were doomed to be unsuccessful due to the stiff logic which inspired their blueprints. However, any new proposition for these area must be characterized by approaches that are responsive and allow for changes and implementation.

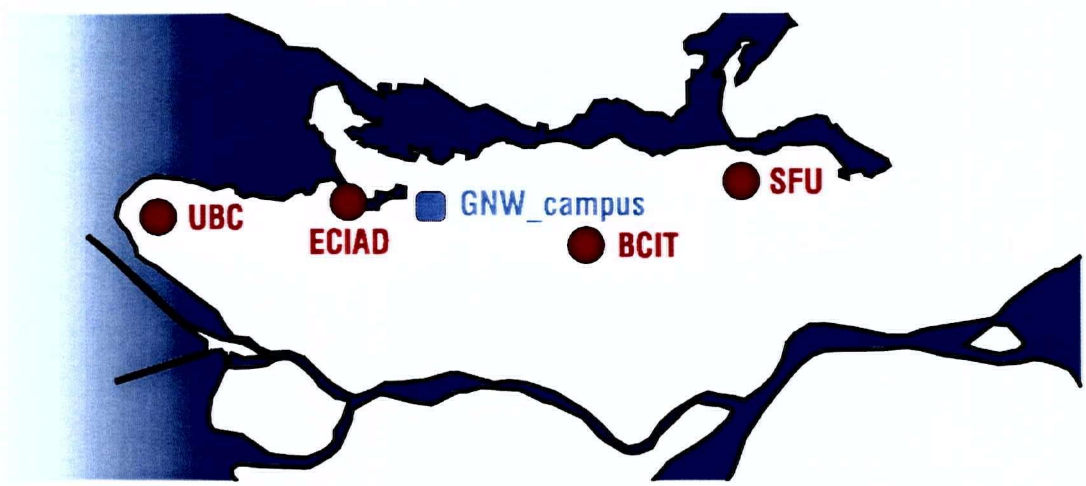


Fig.1.12 – Diagram of the strategic relationship between the existing campuses and the GNW one.

Fig.1.13 – View of the site.

Fig.1.14 – View of the site.

CONTENT: WHAT

PROGRAM ANALYSIS: CLUSTERING

In order to understand the processes at work in the urban environment we must study the components and variables available first. In order words, the raw material represents the basic and still most powerful element to begin to reshape the traditional planning process.

To do so, the first step in the analysis of the program is the search for possible relationships between academic spaces and private sector ones. The methodology followed is based on what we could call rationalization or maximization of either existing or potential links among this series of programs.

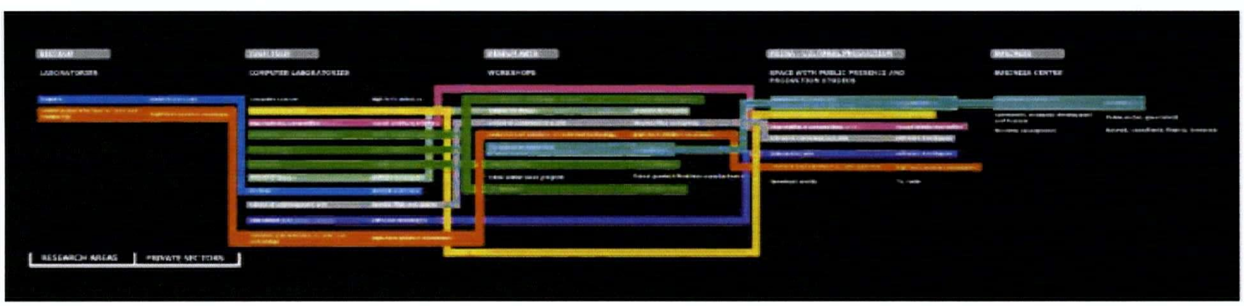


Fig.2.1 – Diagram of the possible relationships among programs.

Then, all the programs are rearranged into a matrix which carefully studies the relationships between each possible association. Through research, existing planning documents and interviews with the members of the consortium in charge of the construction of the campus this chart is quickly filled out allowing a high degree of both participation and experimentation by all the players. The result is encoded by three categories: absence of relationship, exiting connection and potential linkage. The aim of this matrix is to map both the current situation and the potentially new one to be housed in the campus. This set of information is then used to generate sets of clusters.

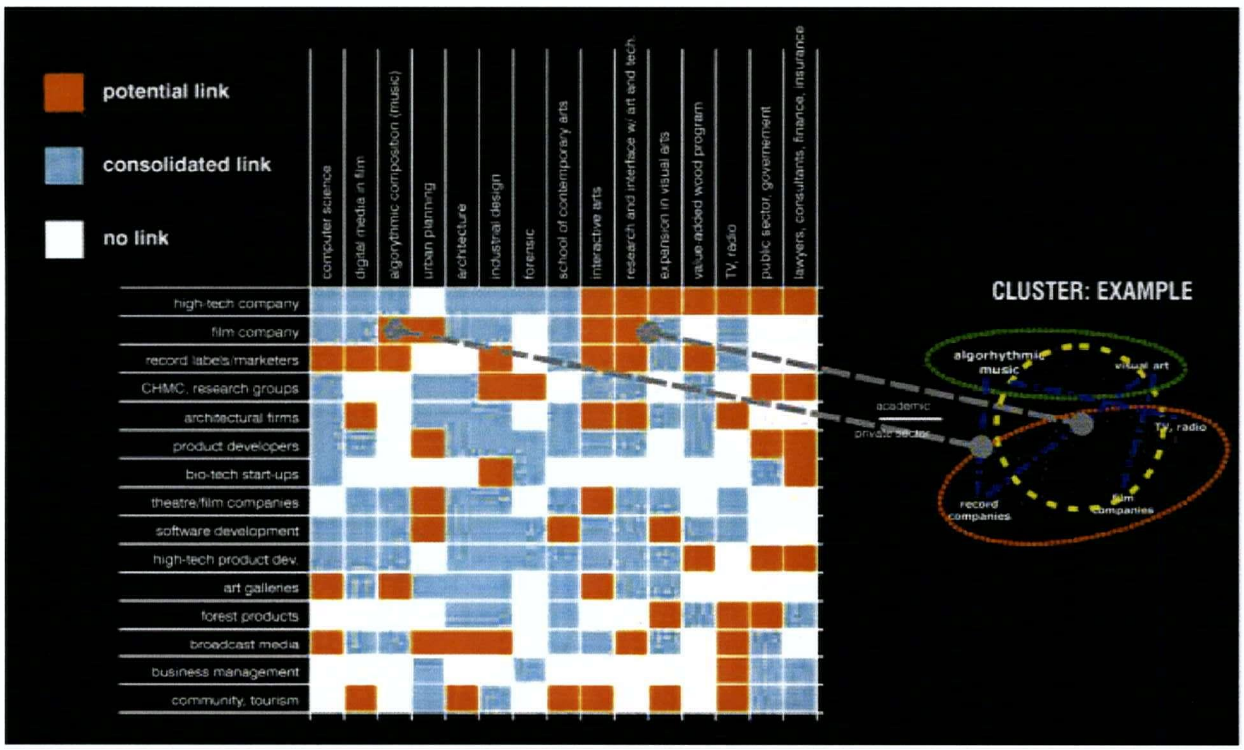


Fig.2.2– Matrix of possibilities.

By using this technique a massive number of examples can be quickly generated. Each cluster mixes two types of variables: first each group is made up by both existing relationships and potential ones to guarantee a degree of sustainability to the single cluster. Second, each combination always interweaves private and academic functions.

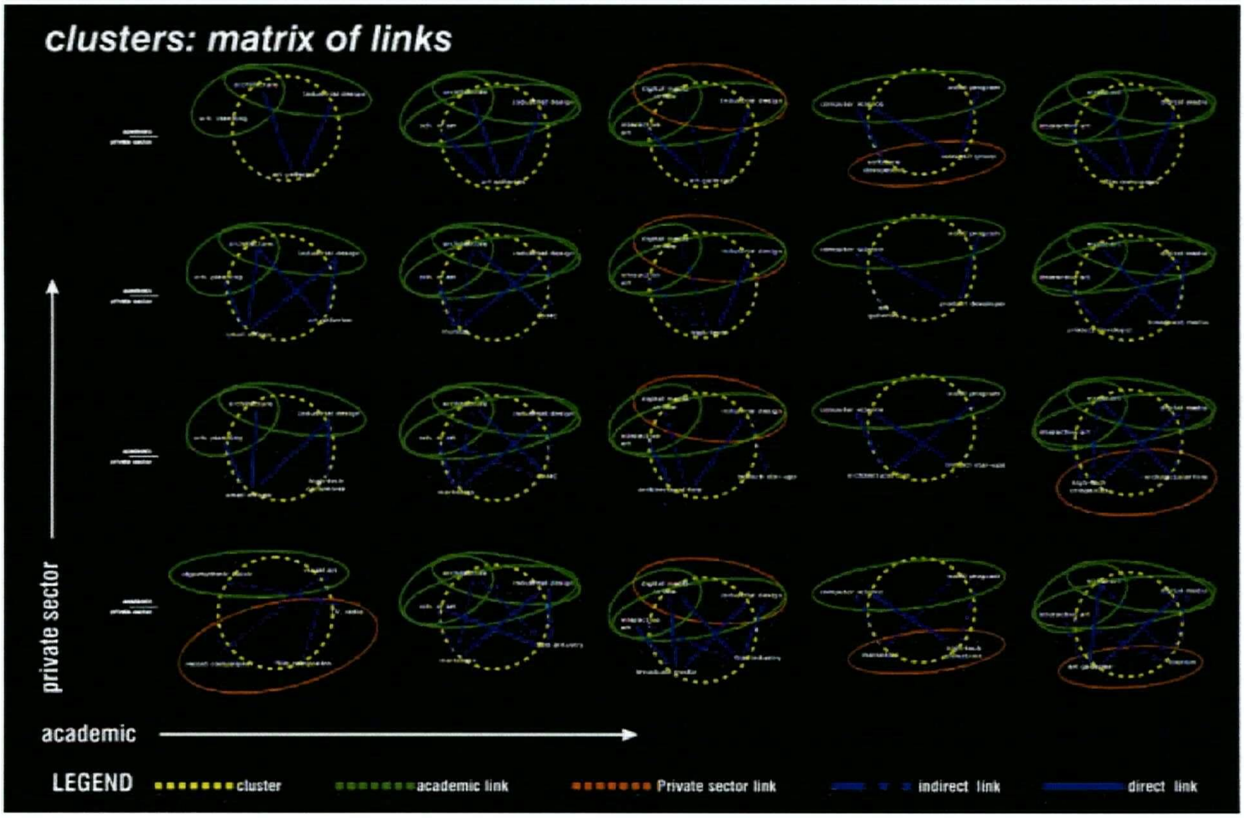


Fig.2.3– Matrix of possibilities.

Each individual group can then be linked to other clusters in order to study hypothetical principles to organize the whole site. Every example is based on two variables: first a quantitative speculation that envisions what factor could lead the urbanization of the area and then a quantitative projection which determines how the site could organize to accommodate the pattern of development.

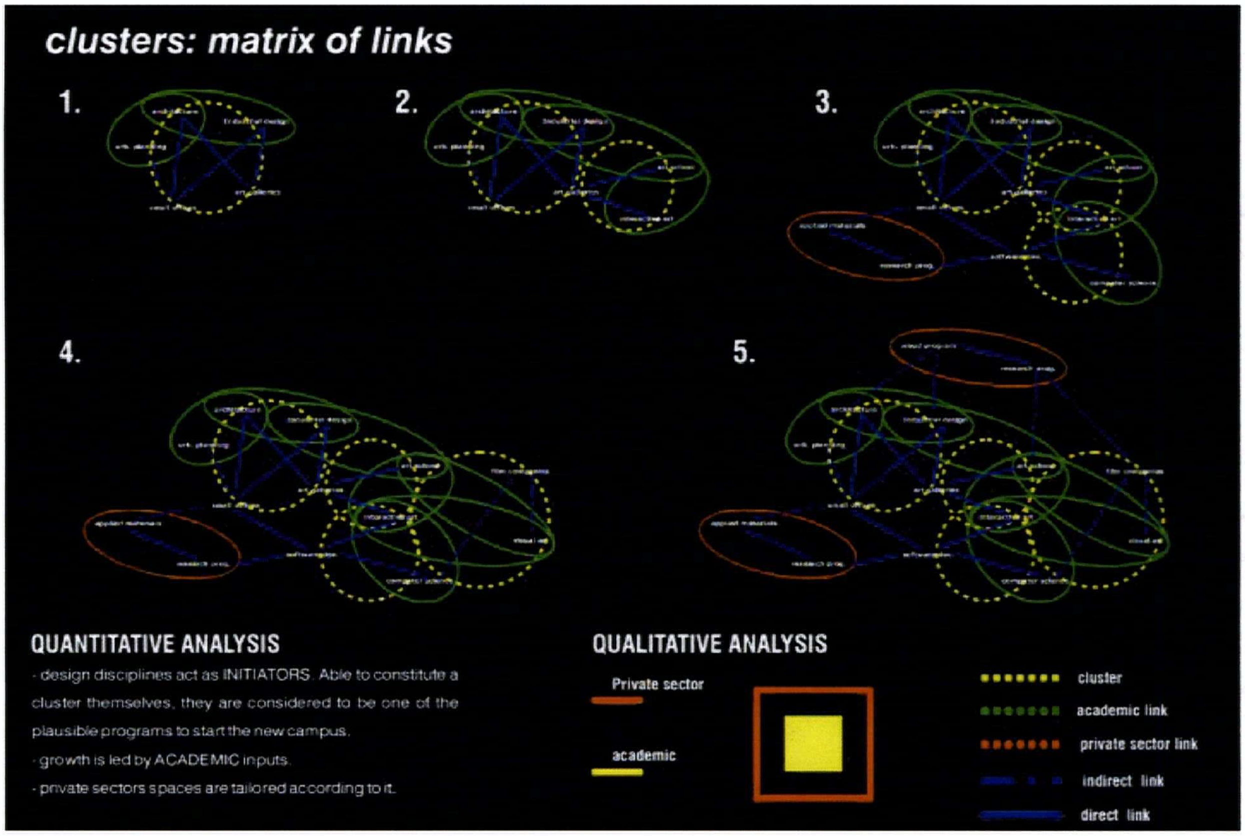


Fig.2.4– Matrix of links.

TECHNIQUE: HOW

S.O.U.P.: the process

This chapter tackles the actual explanation of the planning technique discussed in this thesis. The constructed tool object of this research is called S.O.U.P.. Here, we will discuss its characteristics, principles, advantages, drawbacks and possible implementations.

The first step to begin this planning process is the design of the *info_scapes*. These are virtual landscapes of information, a way to materialize some of the immaterial forces shaping this area (potentially any area).

These initial *info_scapes* map out the existing elements either surrounding or intersecting the site. However, some these components cannot be represented as uniform fields acting onto the area. Manmade artefacts such as main roads, skytrain lines, railway stations and view corridors have a linear or isolated character that is better represented by different geometrical devices such as lines or dots. Nevertheless, these are then turned into *info_scapes* by means of computer-modeled surfaces that register their position and possible peaks of density in their use. By using either planning documents, interviews or simple speculations, it is possible to design several configurations for this first set of maps. For instance, the two scenarios pictured in the XXX are based on the planned expansion of the skytrain line from Broadway Station to the International Airport. It is known that this line will serve the Finning Site as well, however how this will exactly happen is still to be discussed and thus open for propositions. Hence, two different solutions: one in which the new skytrain extension will run parallel to the Great Northern Way (main traffic access to the site) and a second one where the new line will cut across the site with a stop right in the middle of the new campus. At the end of this first section two main *info_scapes* characterize each scenario: one for the infrastructural layout of the area and a second for the position and relevance of view corridors.

Onto this first layer of information sits a second set of *info_scapes* that specifically relate to the program to be housed on the site is laid out. Again, by interview some of the people involved in the planning process of the area, three main functions are singled out. These are: academic institutions, private sector spaces and finally residential areas.
As for the previous *info_scapes*, these are too computer-modeled surfaces whose values along the z-axis proportionally represent their importance across the entire site.
Since these components are to be designed, no a-priori constrain is set. Therefore, any person involved in the planning process or any citizen affected by the new development can interact with this tool and have a say about the area. Local groups, university departments,

investors from the private sector, etc. can design each of these three landscapes and make public their visions.

By means of computer-generated animations is then possible to visualize these "visions" either as whole through continuous surfaces or as singular elements through sets of curves representing sections cut at specific points in the animation.

Through this "what if" series of scenarios an enormous number of precise and yet informed campuses can be quickly generated. But first we need to take a step backward to study what principles support this methodology.

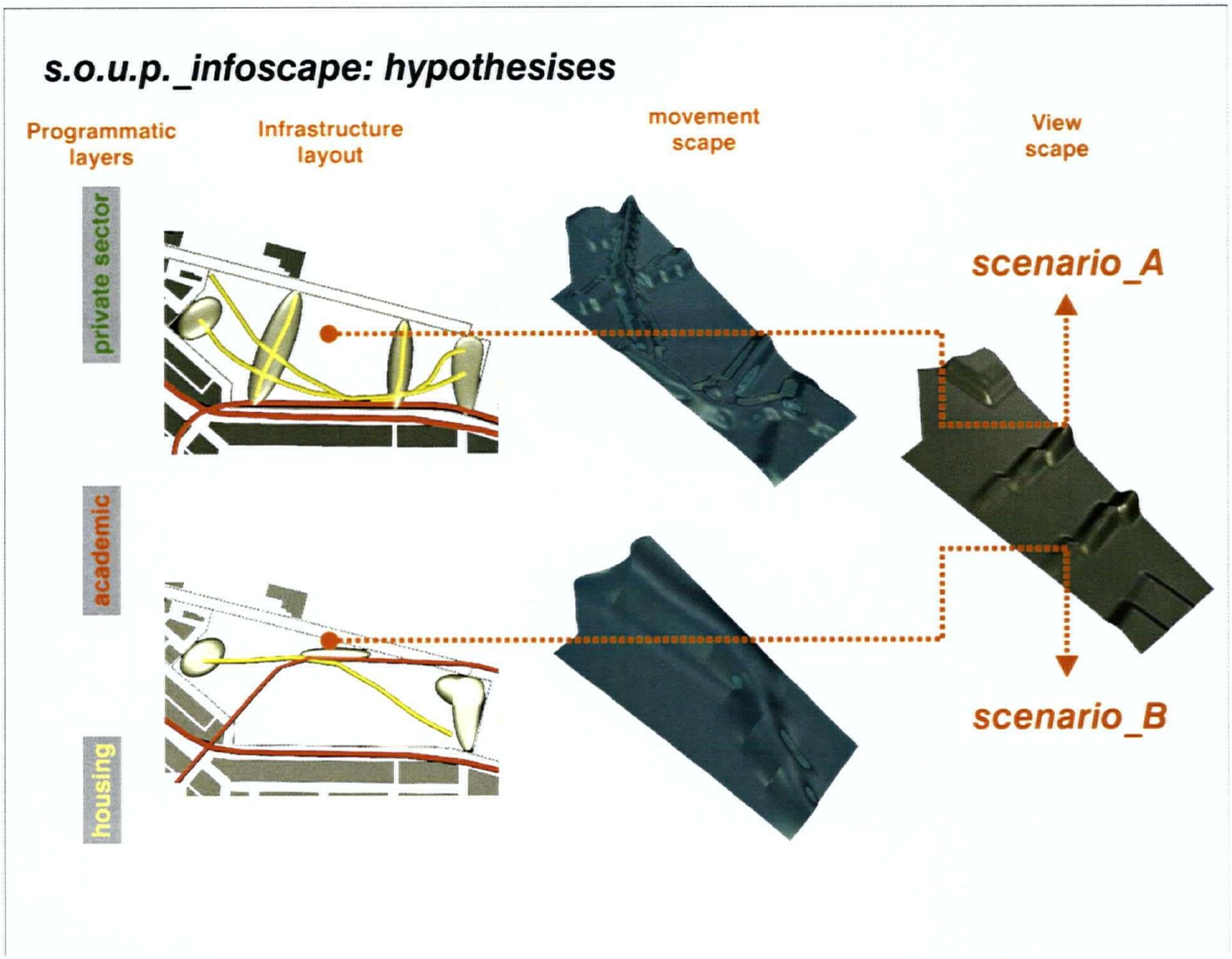


Fig.3.1– Diagram to generate info_scapes.

RESPONSIVENESS

In this process responsiveness replaces what traditionally is understood as flexibility. In fact, where flexibility asks for a generic condition to be operative, responsiveness requires a higher degree of precision to be adaptable (as previously described in the explanation of the concept of Integrated Difference).

CONTINUITY

This principles describes how the methodology establishes a link between the site and the existing conditions surrounding the area of intervention. At this stage, both physical or visible elements present in the area and invisible forces are made evident by this diagrammatic approach. Existing or planned pieces of infrastructure, view corridors (established by the current planning document), and main functions around the future campus are analyzed in a straightforward way.

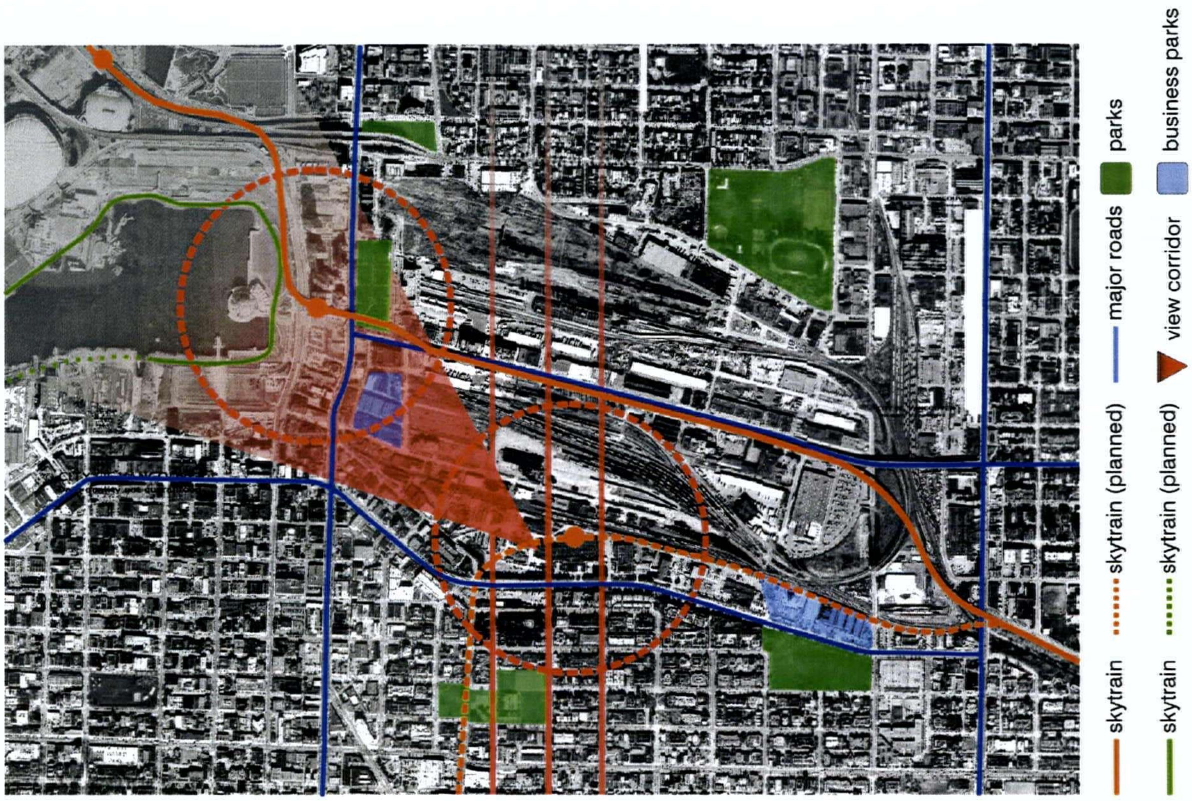
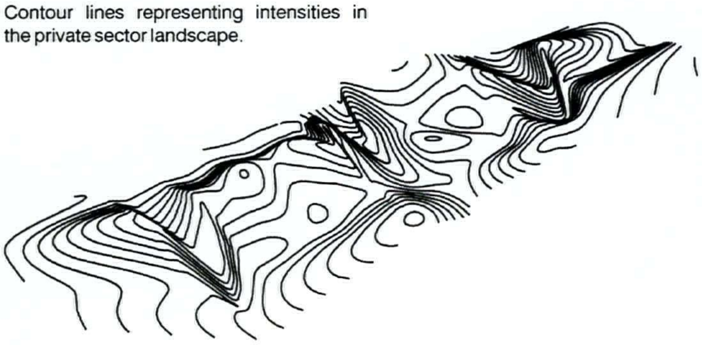


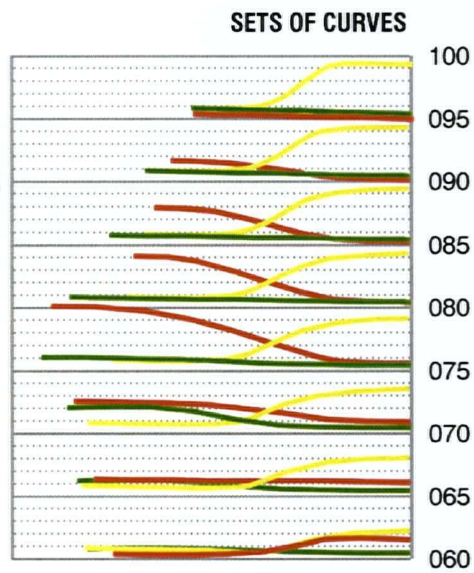
Fig.3.2– Continuity diagram.

INTENSITY

The *info_scapes* previously discussed are all based on the criteria that each force is registered by the diagram by increasing the z-value of the curves. Intensity is the principle that encodes these existing forces into the *info_scapes.*

Contour lines representing intensities in the private sector landscape.





DEFINITION

intensity

1. Exceptionally great concentration, power, or force.

2. *Physics*. The amount or degree of strength of electricity, light, heat, or sound per unit area or volume.

3. The strength of a color, especially the degree to which it lacks its complementary color.

Fig.3.3– Intensity diagram.

RHYTHM

Rhythm has to do with rigor. This principle ensures a direct proportion between forces and diagrammatic representation. In other words, same inputs generates equal outputs.

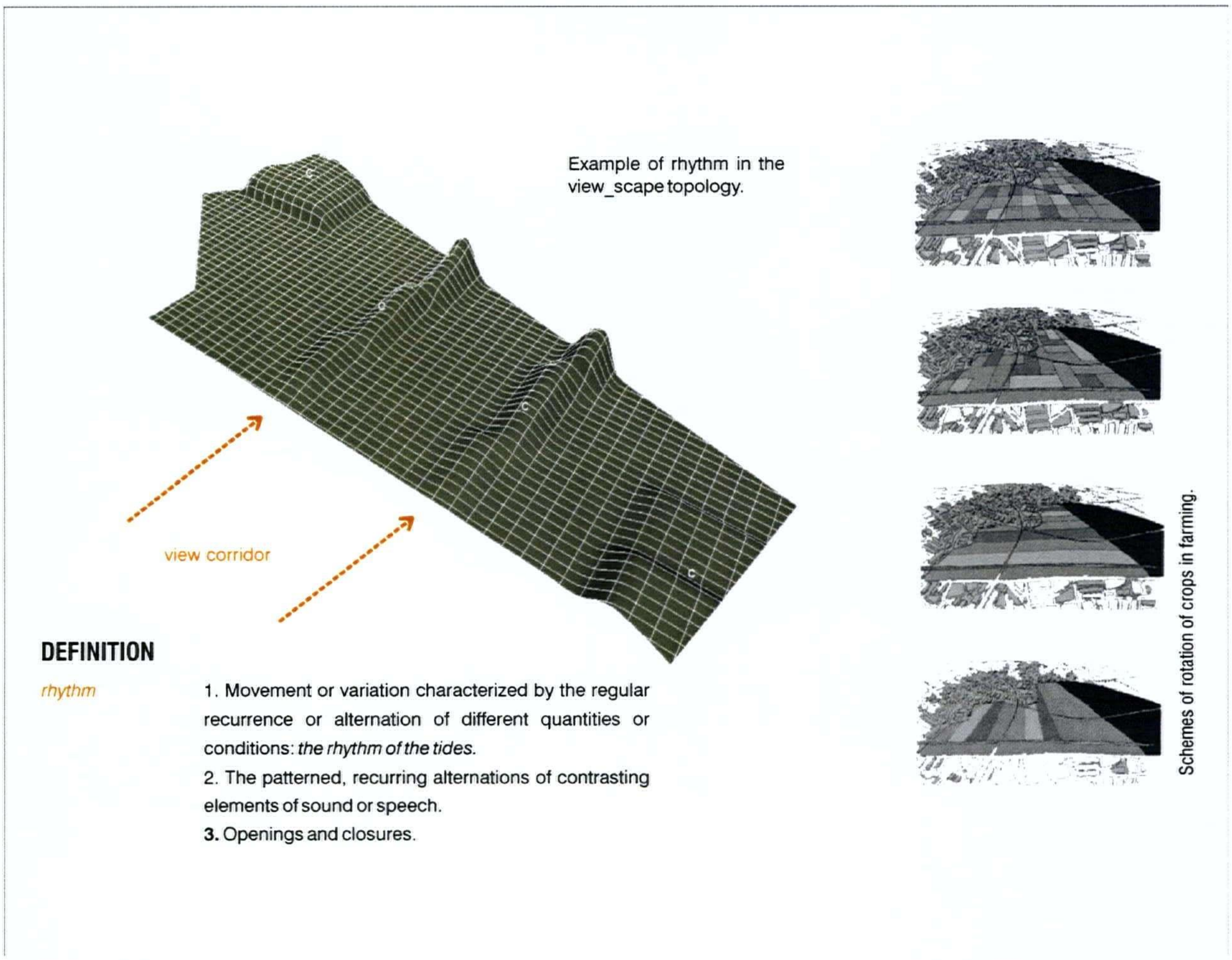


Fig.3.4– Rhythm diagram.

COMPLEMENTARY

This rule begins to set the conditions to turn quantity in quality. Each of the three layers can be controlled and thus its final aspect can be predicted. However, by introducing this specific principle, all the layers are superimposed with the consequence that is no longer possible to guess the final configuration. By adopting a simple rule an enormous series of solutions is created.

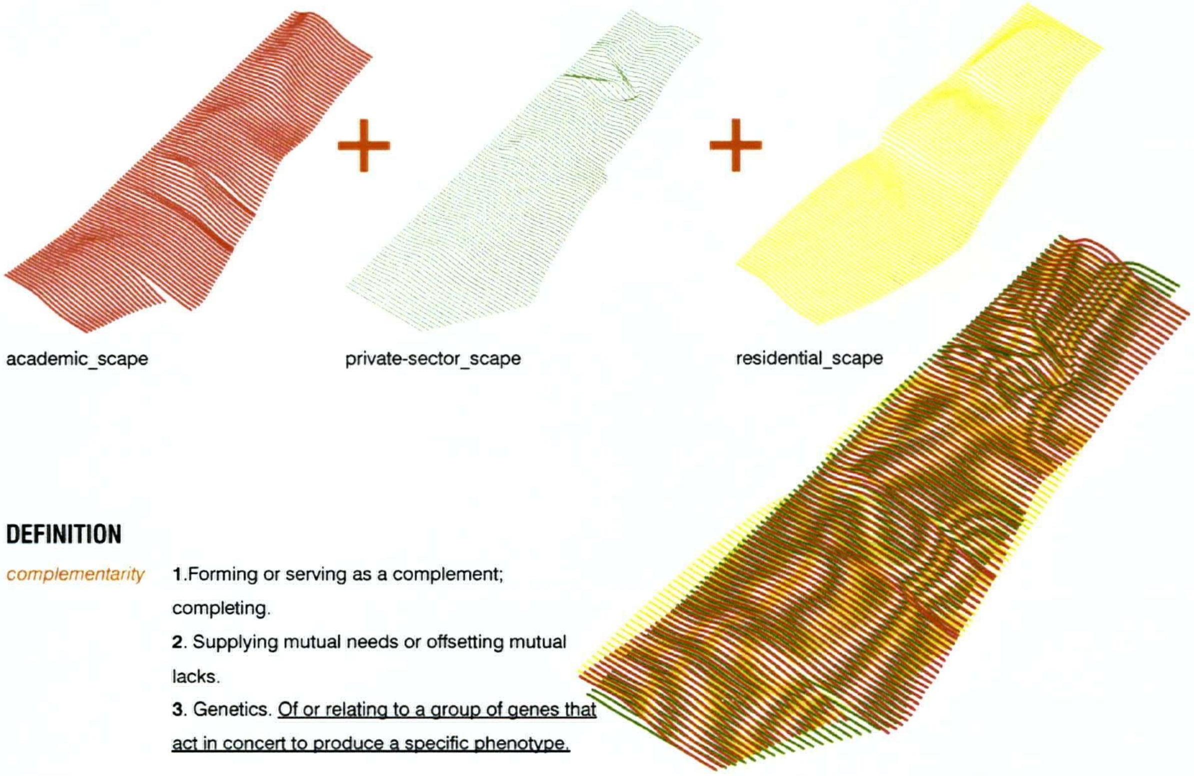


Fig.3.5– Complementarity diagram.

ENCODING PRINCIPLES

A second series of principles is then introduced in order to extract information from the *info_scapes*. The invention of this second set fully tackle the problem of generating quality out of quantity. So far, this methodology has been looking for ways to measure and map quantitative phenomena present in a specific area, from now on the challenge is to produce qualitative inputs with which actually design the new campus.

These principles describe spatial qualities not formal outlines the can be traced. In fact, this thesis doesn't endorse the notion of diagram as a metaphysical device whose outcomes have value in themselves and thus can't be questioned. Here, diagrams are used to refine issues and address the discussion toward the right problem or question. Except for the 'zero principle', all the rules are based on the complementary principle; It is not possible to extract any information from the diagrams unless at least 2 curves are considered.

The only principle that requires further explanation is the noise one which will be the object of the next paragraph.

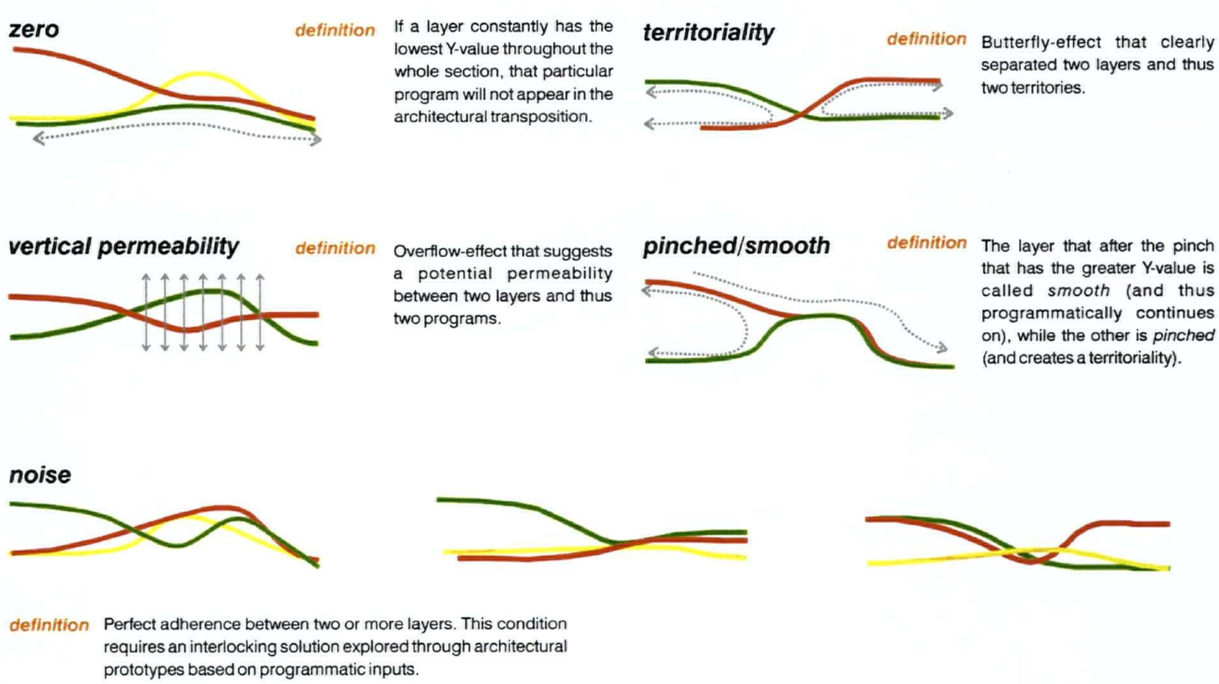
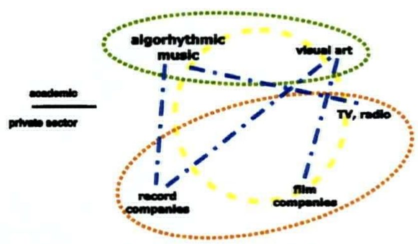


Fig.3.6–Diagram of the second set of rules to encode info_scapes.

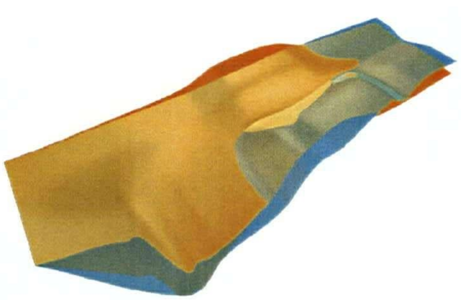
NOISE

Wherever two or more curves intersect each other numerous times within a single section we use this principle in order to encode what would otherwise be a chaotic situation. What is interesting to notice is that noise areas appear as voids in these maps. They represent particular interactions between the programs and, in this sense, they also remind of the idea of programs as being organized around clusters.

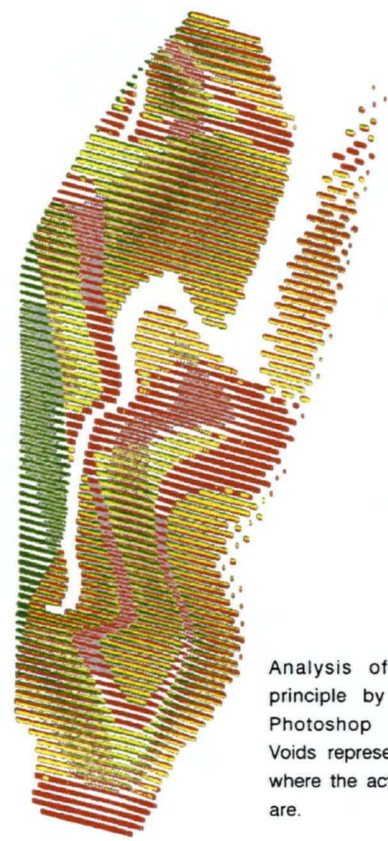
The only way to encode a 'noise' knot is by design a tailored solution for that specific point only.



Cluster example: organizational model for *noises*.



Perspectival view of the three programatic layers.



Analysis of the noise principle by applying a Photoshop brush filter. Voids represent the areas where the actural "noises" are.

Green channel.

Red channel.

Fig.3.7– The Noise principle.

SECTIONAL TRANSPOSITION

One the principles are in place it is possible to apply them to the whole of the scenarios generated. The exercise is relatively simple: each set of curve is separately analyzed by applying to it the already decided rules and a series of quantitative inputs is quickly ready to be transposed into an architectural proposition. By means of intuition, the following step tries to envision what kind of shape or rough massing could embody those initial inputs. At this stage this is only a guess of what architecture can perform. Only by going through a series of variations can quality further be injected into the architectural sections.

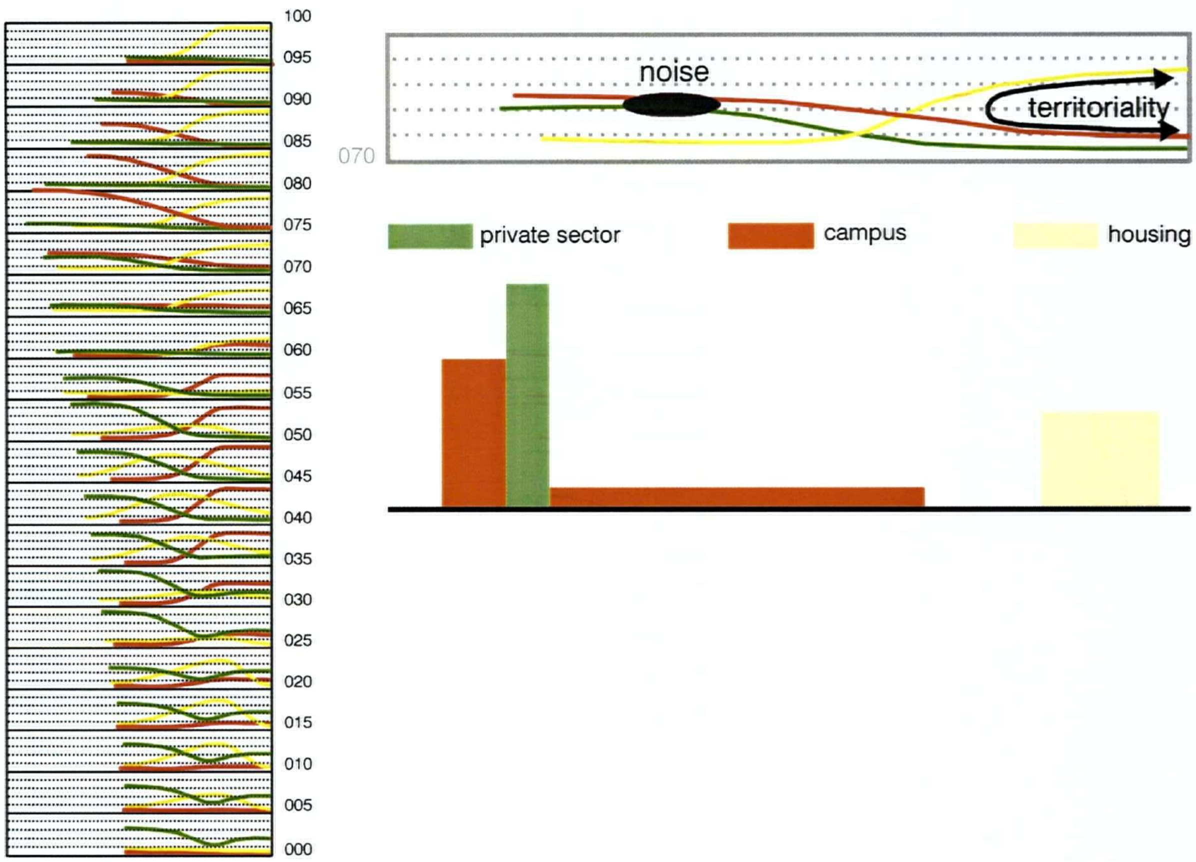


Fig.3.9– An example of a transposition form curves to architectural section.

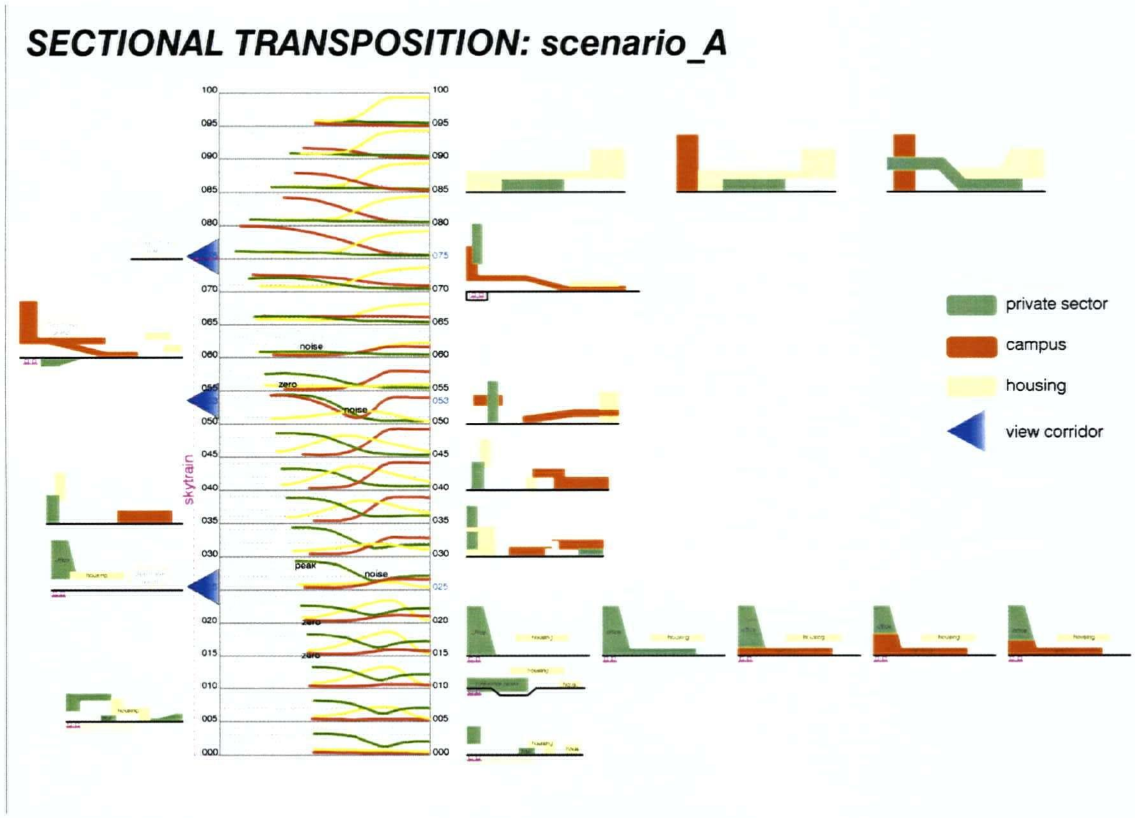


Fig.3.10–Scenario A: The whole set of both transpositions and variations.

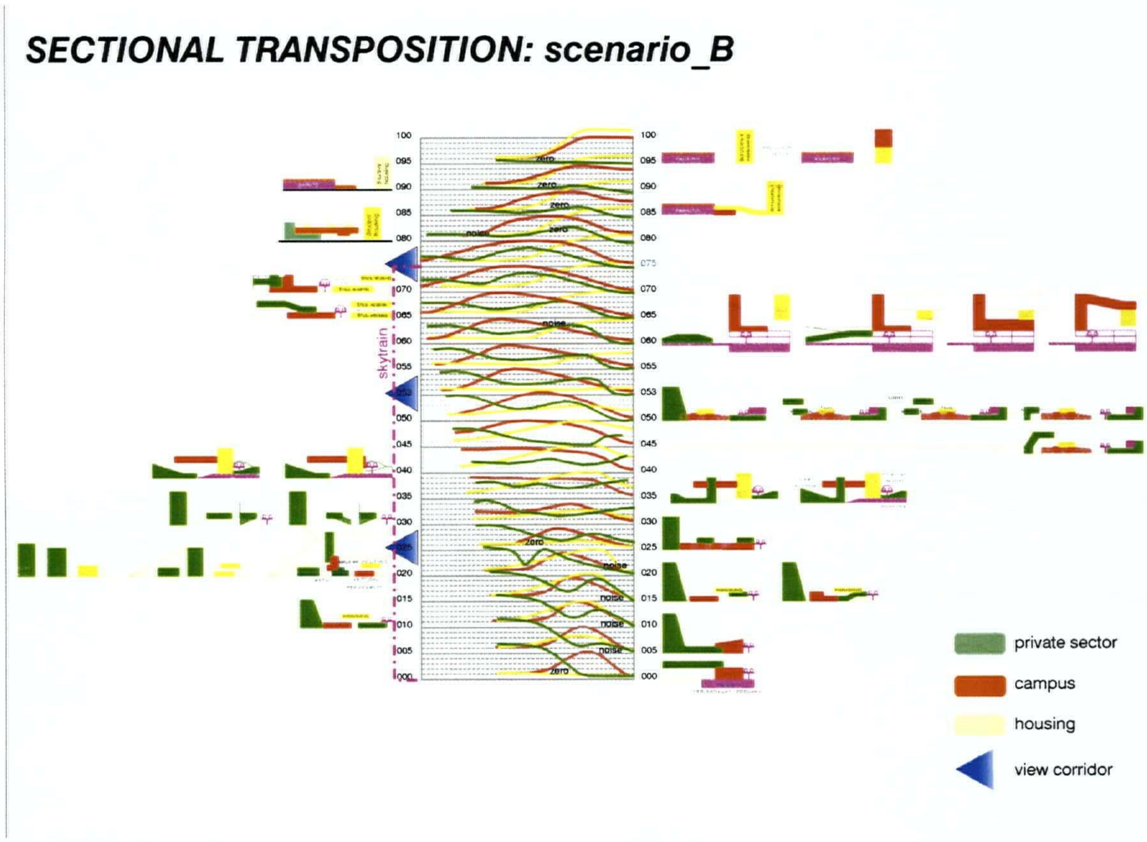


Fig.3.11–*Scenario B: The whole set of both transpositions and variations.*

The two different scenarios were also shaped after the local conditions surrounding the site. Particularly, Scenario A dealt with the skytrain line running along Great Northern Way by creating a linear structure which coincides with the densest area in the new plan, whereas scenario B was based on a more introverted scheme that took advantage of the central position that the skytrain station would have in this hypothesis. The final result of this specific proposal is a much more horizontal layout, a scheme that explores a landscape-like campus.

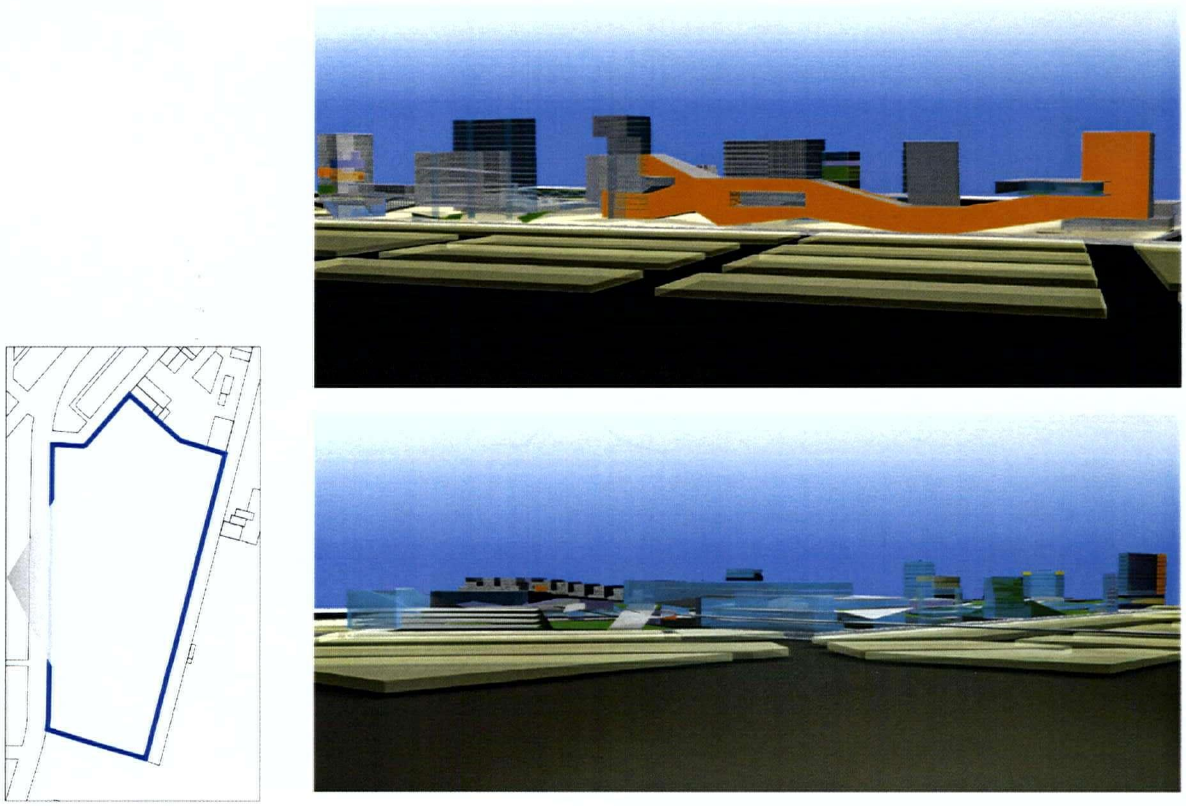


Fig.3.12–Scenario A and B: views from Great Northern Way.

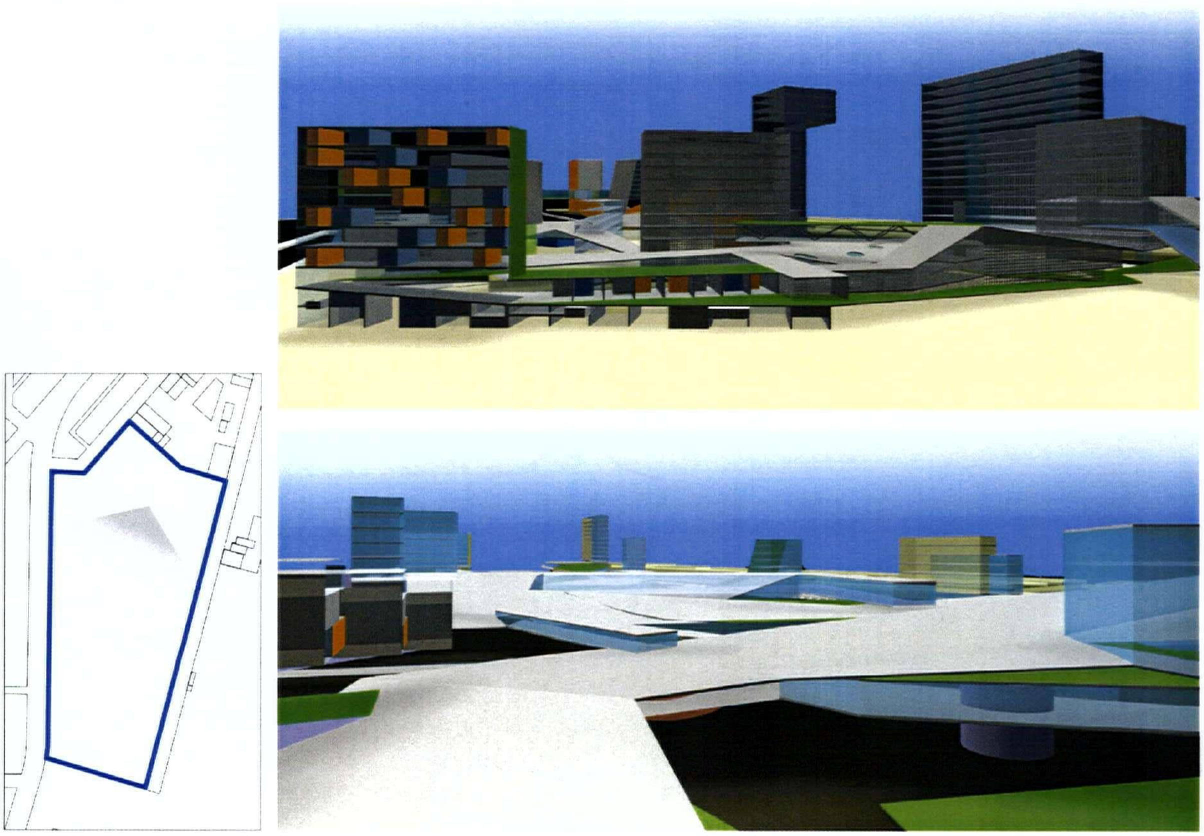


Fig.3.13–Scenario A and B: views from inside the campus itself.

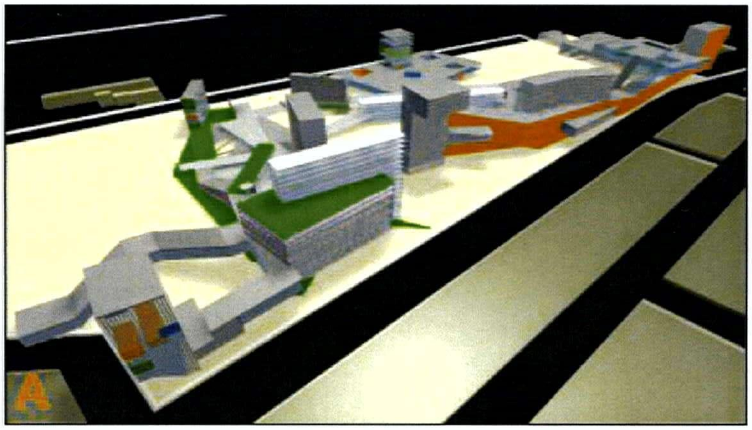
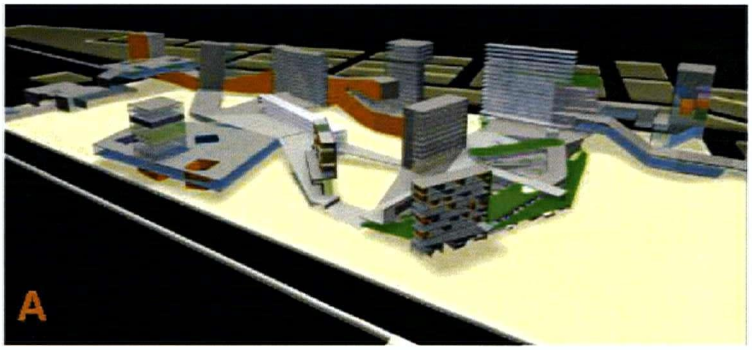


Fig.3.14–Scenario A and B: aerial views.



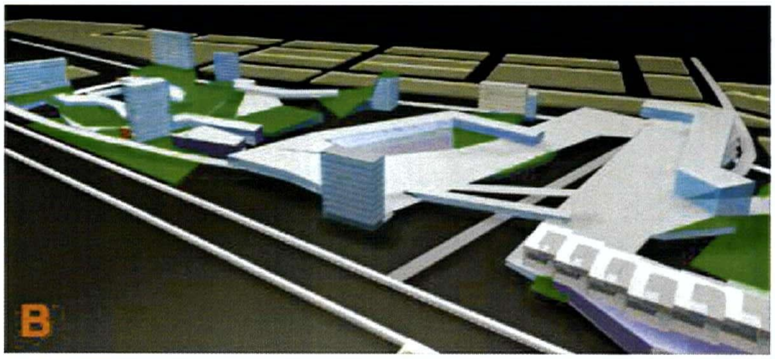


Fig.3.15–Scenario A and B: views from existing rail yards.

NOISE

Finally, a series of prototypes was studied to analyse what type of approach could be taken when noise would surface in the *info_scapes*. Each noise is uniquely interpreted according to location and the cluster of programs that compose that particular point of the campus.

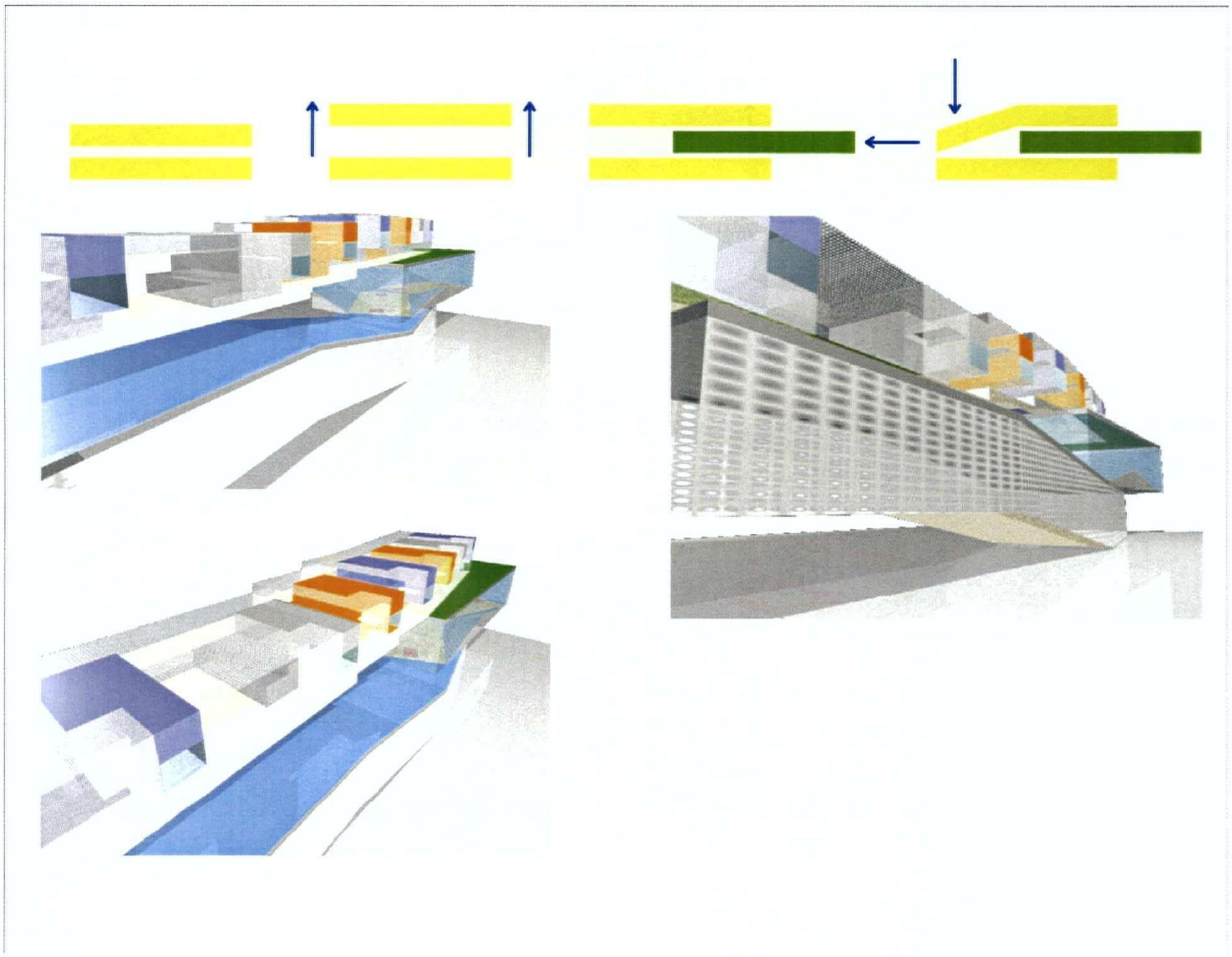


Fig.3.16–Noise: housing + community centre.

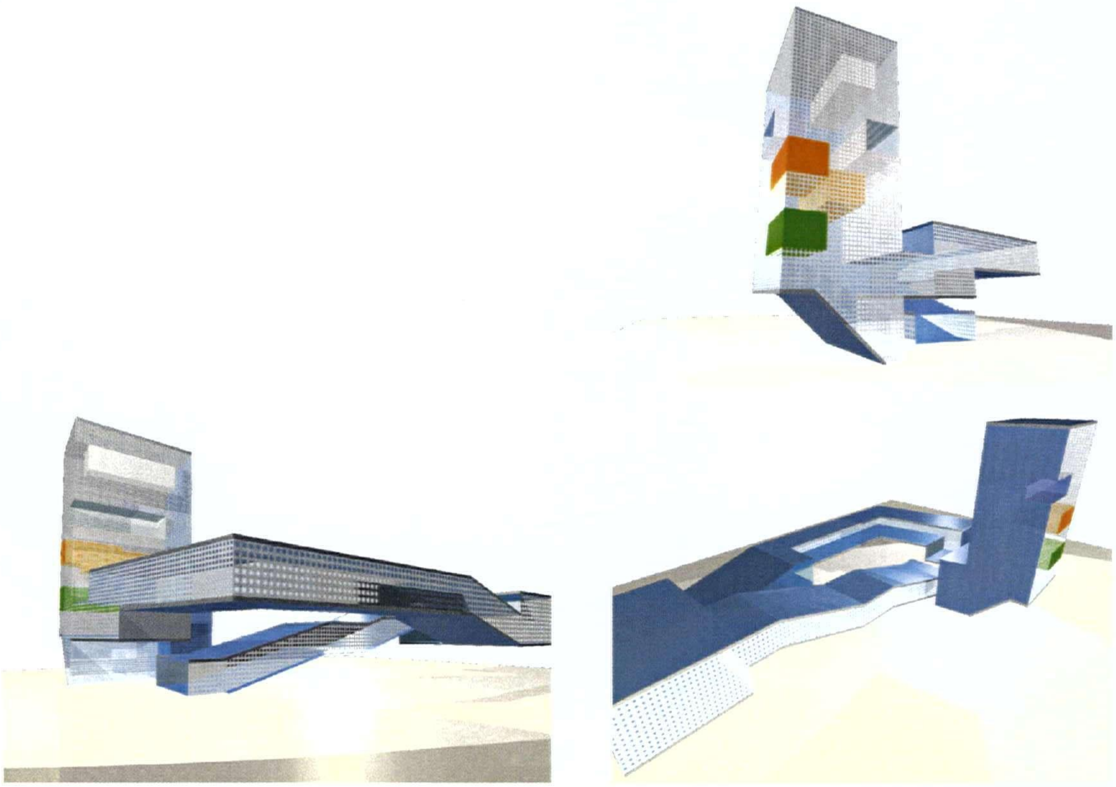


Fig.3.17–Noise: academic space + laboratories.

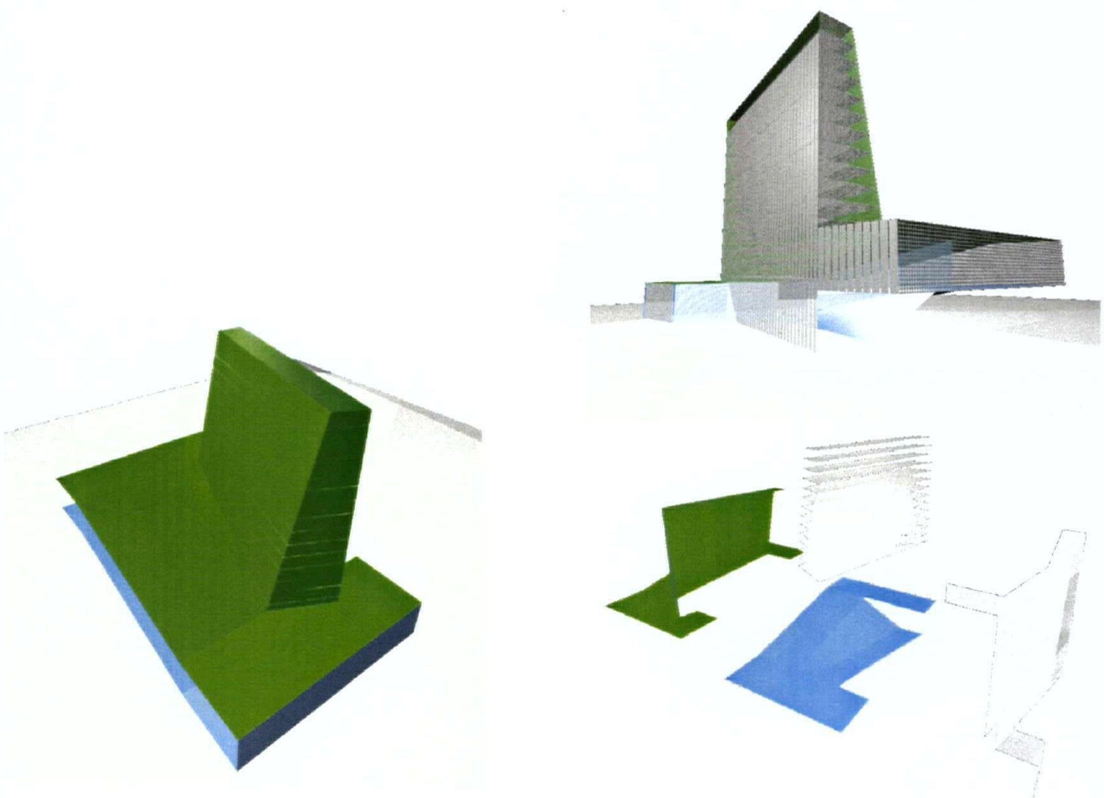


Fig.3.18–Noise: Conference centre.

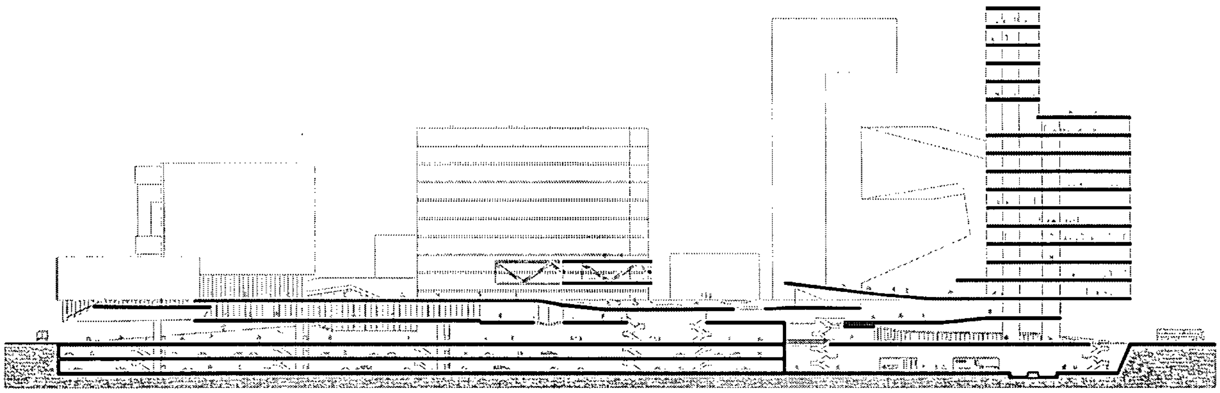


Fig.3.20- Transversal Section through the Campus.

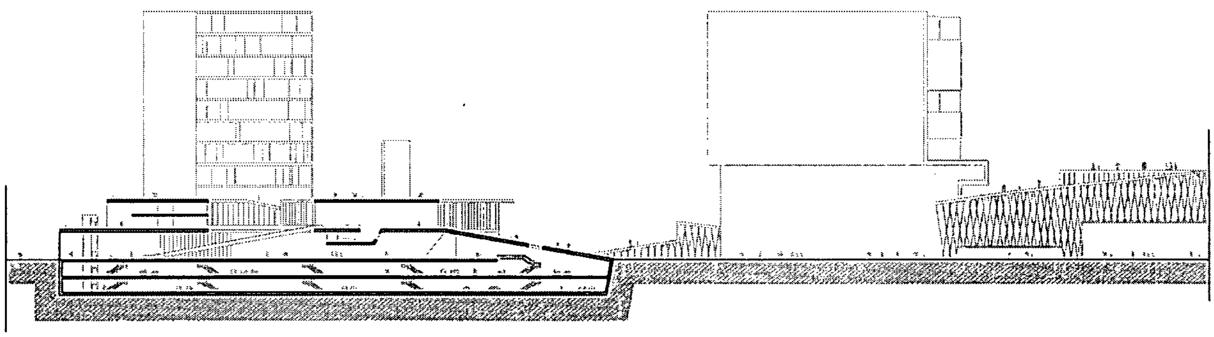


Fig.3.21- Transversal Section through the Campus.

CONCLUSION

The aim of this thesis was to examine why and how issues of complexity, speed and uncertainty are globally increasing and becoming more and more relevant to the architecture field. These questions are not only challenging the importance of urban design, but they are also proposing new problems and potentially new solutions for architects. The critical knowledge gained by going through this exercise suggests that answers to all these themes only lies in proposals that are characterized by innovative, interdisciplinary, methodological and open approaches that no longer articulate the debate around forms or styles but rather around questions and ideas.

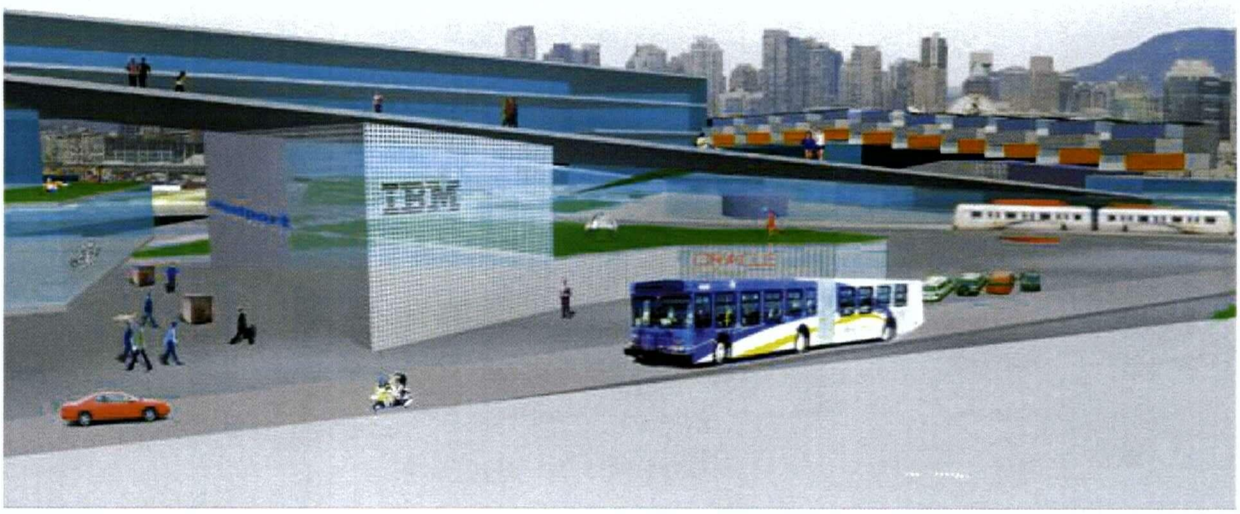


Fig.3.22- Montage.

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