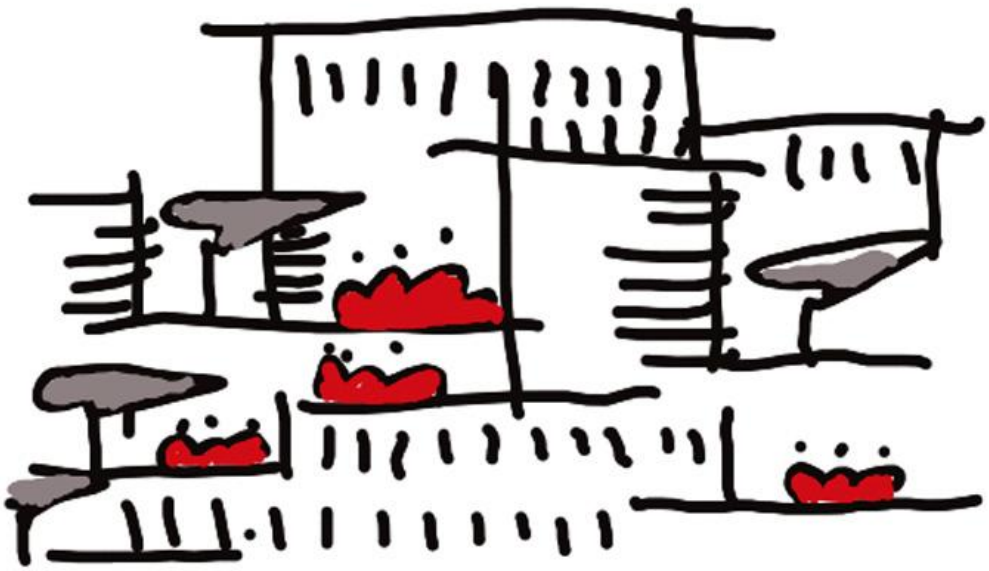
Management of public university campus as real estate object

The case of the University City of Bogotá, Colombia



Flavia Curvelo Magdaniel
June 2010

Primary mentorship: Ir. A.C. den Heijer,
Field of expertise: Corporate real estate management

Secondary mentorship: : Dr. Ir. Y. Chen,
Field of expertise: Urban area development

Delft University of Technology
Faculty of Architecture
Real Estate & Housing Department
Corporate & Public Real Estate Management MSc Laboratory

Colophon

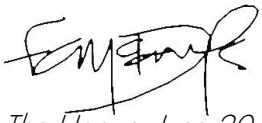
Flavia Curvelo Magdaniel
Student number 1531190
Bleijenburg 8b • 2511 VD • The Hague
The Netherlands
+31624566676
F.T.D.J.CurveloMagdaniel@student.tudelft.nl
Corporate & Public Real Estate Management Laboratory

Preface

This report presents a qualitative research titled "Management of public university campus as real estate object. The case of the University City of Bogotá, Colombia" developed during one academic year started on September 2009, which is part of the graduation requirements within the Real Estate and Housing Mastertrack of the MSc in Architecture, Urbanism & Building Sciences programme at Delft University of Technology. This research is grounded on previous research developed within the Real Estate & Housing Department at TUDelft and is aimed to improve campus management in a specific case within the Colombian context. Thus, the report is presented in six chapters which structure is based on the chronological sequent phases in which this research was developed: Research question, Methodology, Theoretical framework, empirical research, practical results and Conclusions & recommendations.

People used to say that writing a thesis is a lonely process but actually it is not. A number of people deserve my deep appreciation and gratitude for their considerable efforts in helping me make this research much better than it would have been without them. In this regard, I would like to extend special thanks to my mentors; the researchers Alexandra den Heijer and Yawei Chen whose knowledge, experience and dedication guide the path of this research and orientate the curse of its process. Likewise, I would like to extend my gratitude to the campus managers of the University City of Bogotá and other individuals and institutions, such as Nuffic, INJAVIU, SDP; which contributions and inputs during the empirical phase of this study made this research possible. Furthermore, I would like to thanks my friends Richa Singh, Eliot Lee, Andrea Ramirez, Jorn Schmetz, Su Jing Chung, Titia van der Water and Sabira El Messlaki for their support and fruitful time for discussions that certainly constitute an extensive and important feedback for this study. Finally, thanks for the indispensable and continuous support of my family and friends in Colombia, who no matters the distance, provided me enough encouragement to keep working specially during the difficult moments I have been trough as a foreign student.

All in all, writing a thesis has been the concluding chapter of a complete individual experience of studying and living abroad. Indeed, I feel satisfied of having chosen the Netherlands and TUDelft for this experience, that not only has provided me complementary and relevant knowledge to my profile as an architect but has extended my own perspective of this profession and expectations on life. Undoubtedly, doing this research has make me realises of hidden potential and skills opening the doors for professional options in academic and practical arenas.



The Hague, June 2010

Summary

INTRODUCTION

"Educational institutions are no longer isolated institutions, but serve as the driving force of the knowledge economy. They provide knowledge workers for the future." (Den Heijer, De Vries, 2007).

Since higher educated people have been seen as human capital, the city planners have developed strategies to hold them as young entrepreneurs for the economy of the city which is increasingly focused on knowledge and services. Indeed, real estate is a relevant aspect which supports the primary tasks of the knowledge institutions and creates their urban environment. In this context, university campus as real estate object never stands alone but forms an integral part of a socio-physical context. It does so, by influencing city developments and contributing to social formation, since universities expand their own institutional mission beyond their borders to the city. Accordingly, the management of university campus has become a complex decision making process that involves many internal and external stakeholders whose interests and visions differ according to local socio-economic conditions.

With this in mind, the research presented in this report, focuses on managing and dealing with real estate decisions for university campus in a specific context, which main topic –Management of university campus- is grounded on previous and current research in this field that has been carried out by the researcher Alexandra den Heijer within the Real Estate & Housing department at TUDelft in co-operation with campus planners of all Dutch universities called "Managing the university campus", which provides universities with conceptual model and tools to improve campus management. Nevertheless, since methods and instruments provided by theory and empirical research are generic, this research arose to test their applicability to improve campus management in a specific case: The university City of Bogotá (UCB). Thus, this case is the starting point and target for the intended results, which main purpose is to provide practical advice to improve its campus management by using established conceptual instruments within the domain of Real Estate Management in different contexts and outlining the urban position of the university in the city as a source of complementary instruments to improve campus management.

Motivations

The selection of the "University City of Bogotá" as object of study in this research, is motivated by two personal reasons. First, as an international student and during the completion of the first year of MSc in RE&H at TUDelft, there has been a permanent quest to link the contents learned from the Dutch background with the situation in my home country which is Colombia. In this way, an interest concerning to the application of the acquired knowledge in a foreign context came up, due to the practice of real estate management might differs according to the context, specially in public institutions. Second, professional experience in campus planning acquired by working during three consecutive years as part of the design team in charge of the last formulation phase and early implementation of the Management and Regularisation plan of the University City in Bogotá, provided me with essential knowledge to approach the case.

Nonetheless, with the skills and tools acquired after the completion of the first year of this master study, my view on planning has became wider, which motivated an inner need to apply this knowledge in a practical case related with my professional experience, in this case not from campus planning but from the campus management perspective.
All in all, to make this research possible, the selection of the primary mentorships to conduct this study opts for the researcher Ir. Alexandra den Heijer, whose knowledge in the field not only ground but guide the main contents of this study. Equal important was the selection of the secondary mentorship which complemented the orientation of this research with the advice of the Dr. Ir. Yawei Chen, whose knowledge and experience about management of urban areas in a foreign context conduct the complementary contents of this research as well as the case study approach.

Report structure

The content of this report is presented in six chapters framed in the chronological sequent phases in which this research was developed. In this sense, the first chapter addresses the background of this research by establishing the research questions, its components related to a basic assumption. The second chapter focuses on the research methodology. Furthermore, the third chapter is dedicated to the theoretical framework by contextualising the research with existing knowledge. The fourth chapter is an ample descriptive part dedicated to the empirical research which focuses in the analysis of the University City based on the main theoretical output. Consequently, the fifth chapter provides an answer to the main question of this research focused on the practical results. Finally, the sixth and last chapter provides the main conclusions and suggests some recommendations.

PUBLIC UNIVERSITIES AND THEIR CHANGING CONTEXTS

Colombian public universities have been facing a constant diminishing of financial resources from the government that threats the development of education and research as end institutional goals. Likewise, increasing social and spatial demands from society, users and policy makers combined with uncertainty future changes increase complexity in campus management process. This trend is not unique in Colombia; researches in the USA, UK and the Netherlands have revealed the increasing demand to improve campus management and optimise the use of their physical resources, that certainly involves large investments sometimes unforeseen within universities' budgets.
According to Heijer, A. den (2008) the most important uncertainties in spatial demands (both qualitative and quantitative) for higher education institutions are related with (1) Diversity of student population with different space requirement, (2) ICT developments, (3) Cooperation with stakeholders to share facilities with and (4) Student enrolment and mobility between (inter)national institutions, where flexibility becomes a necessity on building and campus level: technically in terms of adaptability, financially in a mix of owned, leased and rented space and organisationally in better use of the capacity without hindering the institutional goals.

In this complex perspective, real estate plays a relevant role fulfilling university's function and its management becomes crucial in order to align the fulfilment of university's function with current and future demands by supporting universities' institutional goals and missions. Therefore, since the UCB is experiencing the problems explained in the previous perspective, this research addresses as main question:
How can the UCB improve the management of its campus as a real estate object in order to support their institutional goals ?

In this regard, since this research explores a single case, it is outlined that higher education institutions cannot avoid the physical and social context in which their develop and fulfil their functions. This statement grounds the exploration of "campus as real estate object" within the real estate management discipline, which is approached under the basic assumption that the real estate management of higher education institutions with large scale campus is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies' orientation, derived from the hypothetical dual position of these large scale real estate objects between area-portfolio levels, which certainly influences campus management and can be used as sources to improve it.

CONTEXT MATTERS WHEN SELECTING METHODS

The practical orientation of this qualitative research, which is focused on a specific situation, makes the context an important and structuring aspect for the selection of research methods. Therefore, the particular quest for qualitative information uses literature study and single case study as primary methods combined with other tactics such as interviews and multiple review of existent case studies from previous empirical researches. Accordingly, while the literature study provides theoretical frame to this research and its hypothesis by connecting the exploratory questions with existing knowledge on the established research **subject:** real estate management, the case study provides empirical context to this research by testing the applicability of the mentioned theoretical output in order to answer the analytical questions linked to the established research **object:** the University City of Bogotá. For instance, a preliminary analysis of the UCB's context (Bogota and Colombia) was crucial in order to compare it -in a broad sense- with references of initiatives used by other higher education institutions to improve campus management in different socio-economic context. In fact, the context of the knowledge economy served as appropriate background in this research, through the use of established generic frameworks or analytical qualitative structures where quantitative differences overseas are non relevant for comparison. Therefore, it is outlined the use of a framework about the foundations and activities of the knowledge city, developed within the study "European cities in the knowledge economy" (Berg, L. van den et al., 2005). In general, the empirical research revealed that qualitative instruments and references are strongly tied to their contexts and their usage and assessment must be done carefully in order to avoid misinterpretations resulted from subjectivity.

CAMPUS AS A REAL ESTATE OBJECT

University campus as real estate object possesses two singular conditions which define the orientation of its real estate management and therefore the focus of its real estate strategies: the character of universities as "institutions" and the large scale size of their accommodation, which together bring complexity to its management by adding urban demands tied to their socio-economic contexts besides the institutional ones. In this perspective, campus real estate management and its areas of practice (acquisition, development and financing) has to deal with different layouts such as society, individual and organisational demands in context. This academic insights were translated into "conceptual framework" which is a direct and individual interpretation of the available knowledge in a broader scholastic manner, which attempt to organise the use of multiple instruments - available in theory and other empirical researches- into an intended frame that facilitated the analysis phase of this research and permitted to identify three "analytical layers" to improve campus management: L1- Institutional-societal demands; L2- Campus real estate supply in its context; and L3 – Campus management process as target for improvement.

THE UNIVERSITY CITY OF BOGOTA (UCB) CASE STUDY

The University City is the name given to the main campus of National University of Colombia which is the largest public university in the country with the largest campus of the country located in Bogota, which occupies an area of 1'207.657m2 and is composed by 131 buildings on total. Likewise, the current portfolio of the UCB is diverse; it counts not only with buildings for academic and administrative purposes to accommodate eleven faculties, twelve centres and twelve institutes that sum up a community of more than 30.000 users but cultural and sport facilities for the use of the students and citizens communities such as museums, concert halls, church, a large sport fields with a stadium, and a large amount of public space an green areas which strategic conditions of its location, in terms of urban development, accessibility and connectivity, could be used as mean to attract external users that might be partners for investment on physical resources, which is certainly need it due to the aged and outdated condition of large part of the portfolio. Despite the strengths of its location, the isolated and gated condition of the UCB's settlement in relation with its surroundings remains the biggest challenge for campus managers to deal with the external layout in which campus as real estate object is positioned.

Nowadays, the campus managers of the UCB are aware of the relevance of the physical resources supporting institutional visions, and either their strategic situation in the urban context. Therefore, an increasing list of projects has been developed during the last years that has represents a growth in investments that are not covered by their budgets and now they are looking for new sources for finance their projects.

However, the empirical research has evidenced that in order to achieve their goals, a redefinition of their plans is need it. For instance the following are the areas to improve campus management identified along the analysis of their real estate supply in context:

1. Efficient allocation of physical and financial resources available
2. Effective use of the available knowledge and human resources in the management process
3. Simplification of processes and delegation of functions

Indeed, the first area to improve is the focus of the strategic plan presented as follows. Meanwhile, the other two areas to improve campus management are implicit in the conclusions and academic insights of this research.

STRATEGIC CAMPUS MANAGEMENT PLAN FOR THE UCB

The previous empirical insights were synthesised into a practical advice for the University City of Bogotá, which was drawn up in a form of "strategic plan" guiding the allocation of physical and financial resources of the mentioned case aimed to provide a solution for the current problems of the campus –starting point of this research- driven by three Strategic Action Lines: *A. Enhancing distinctiveness and prestige; B. Supporting university's function; and C. Stimulating social integration*. Therefore, based on the assumption that "real estate management of higher education institutions with large scale campus is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies' orientation"; this strategy is based on the concept of integration.

According to the feasibility evaluation of this Strategic Plan, it is outlined that besides the evident financial and regulatory implications - present in any real estate strategy- there are several social and urban issues influencing campus real estate strategies in a positive way that are relevant to improve campus management.

In this regard, , due to the social relevance of this practical result, and the extensive contents of the analysis and synthesis phase, the scope of the study goes beyond the intended target (Mangers of the UCB campus managers) by involving a larger group of city planners, city policy makers and all actors related with the development of knowledge intensive activities in the context of Bogotá and its region including managers of other HEI's.

CONCLUSIONS AND RECOMMENDATIONS

The ambitious goal of this study, which is to "improve campus management", brought a high degree of complexity to this research, since the meaning of the word "management " is very broad. For instance and for practical reasons, the conclusions of this research are distinguished into practical and academic, by addressing how the theoretical insights were translated into practical advice capable to application and providing new contributions to the Real Estate Management discipline respectively:

(1) The practical results and findings of this research could be useful for many other Colombian and Latin-American universities with the similar institutional characteristics and physical settlement of its campuses, which management process involves a number of external considerations beyond internal capacities, mostly driven by specific contexts. In this regard, it is outlined that campus real estate strategies play a relevant role strengthening city's knowledge foundations in the context of the knowledge economy such as Quality of Life, Social equity and urban diversity, through the promotion of Social integration. In these sense, Furthermore, this study suggests the use of comparable analytical frames instead benchmarks as reference tools, where best practices can be adapted according to specific conditions in different contexts rather than transferred. Nevertheless, the different solutions outlined in references from practice are strongly related with their contexts and the application and interpretation of reference tools must be used carefully.

(2) The academic insights supports that real estate objects such as campuses are recognisable large scale units composed by a number of buildings and large pieces of land strongly tied to its context. The theoretical and empirical phases of this research has evidenced that according to its dual scale position between portfolio and area levels, the improvement of its management involves three primary aspects: Diversity of stakeholders; Diversity of Policy; and Dynamism of management roles. For instance and based on these aspects, the crossing review of a large number of instruments suggests the use of three instruments considered as primary to improve campus management in practice: (a) Stakeholders' analysis: by using the "Basic framework for campus management, connecting four stakeholders' variables" (Heijer, A. den, 2006); (b) Real Estate Policy analysis by using an academic approach developed within the Real Estate & Housing Department at TUDelft; and (c) Real Estate Strategy planning & implementation analysis by using the so-called "Dynamic cycle of Campus management roles" developed during the empirical phase of this research as an individual interpretation of the shift of the real estate management role from operational to strategic.

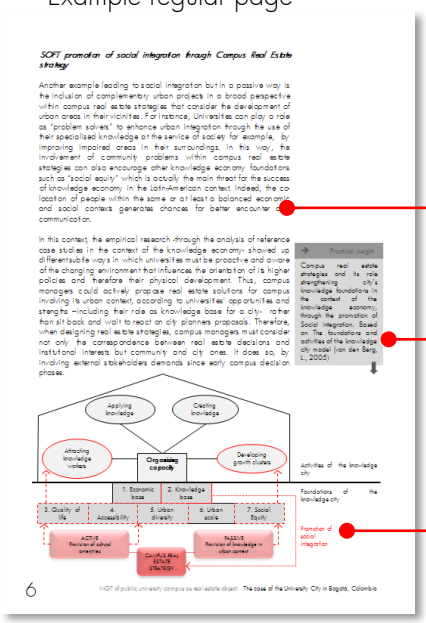
In general, it is outlined the first approach of this research, which focuses on improving campus management by using CREM as primary field and UAD as complementary one. However, the identification of the relevance played by external factors pertaining to the urban context within the real estate decision-making process in large scale objects such as campuses, opened a debate for the inclusion of social issues within real estate strategies -strongly associated with specific organisations and their contexts- not fully provided by the available knowledge on Corporate Real Estate Management, that can be addressed for future research within the real estate management discipline.

Readers Guide

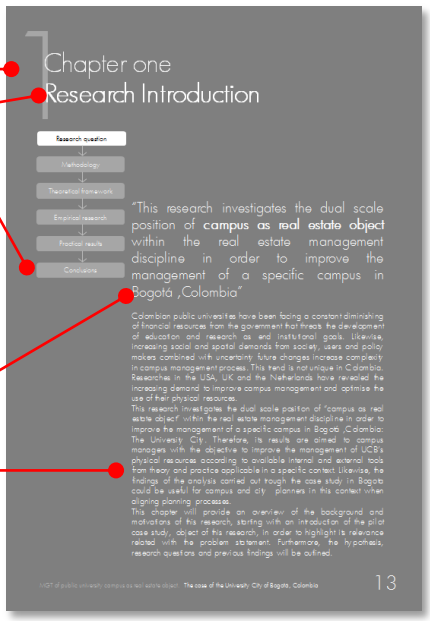
This report is presented in a very descriptive manner which structure is based in a main text body, complemented with figures and schemes mainly outlined within the central text body. Furthermore, the important remarks of the written document and additional insights are highlighted by using additional grey boxes located besides the text body. Likewise, the same format with boxes was used to address the references from case studies provided in the empirical research, but highlighted in red.

In order to make clear the structure of this report, which is presented in six chapters, each one is provided whit a grey cover page that addresses a short introduction of the contents and findings of each research section. Furthermore, attention must be paid to Chapter 4 which extensive content is divided into four sections provided with a cover as well but in grey. Finally, the Appendices are found at the end of this document.

Example regular page



Example cover page



Number chapter
Title chapter
Stage of research
Central body
Relevant Remarks
Findings Headline
Introduction body
Illustration

Common Abbreviations

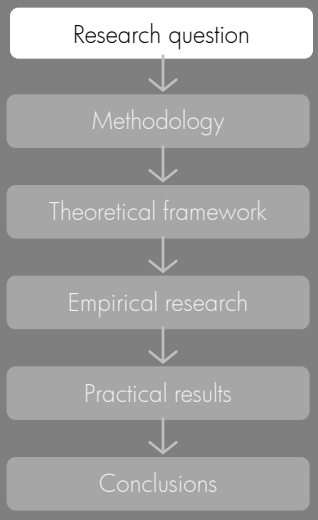
MGT= Management
CREM= Corporate Real Estate Management
UAD= Urban Area Development
GM= General Management
AM= Asset Management
FM= Facility Management
MM= Maintenance Management
UCB= University City of Bogotá
HEI= Higher Education Institution

Glossary of Spanish terms

UNAL= Universidad Nacional de Colombia (National University of Colombia)
SDP= Secretaria de Planeación Distrital (District Planning Secretary)
PRM= Plan de Regularización y Manejo (Management and Regularisation Plan)
CCB= Cámara de Comercio de Bogotá (Chamber of Commerce of Bogotá)
CAN= Centro Administrativo Nacional (National Administrative Centre)
POT= Plan de Ordenamiento Territorial (Strategic Plan of Bogotá)
UPZ= Unidad de Planeamiento Zonal (Zoning Planing Unit)

Contents

Chapter one
Research Introduction



"This research investigates the dual scale position of **campus as real estate object** within the real estate management discipline in order to improve the management of a specific campus in Bogotá ,Colombia"

Colombian public universities have been facing a constant diminishing of financial resources from the government that threats the development of education and research as end institutional goals. Likewise, increasing social and spatial demands from society, users and policy makers combined with uncertainty future changes increase complexity in campus management process. This trend is not unique in Colombia. Researches in the USA, UK and the Netherlands have revealed the increasing demand to improve campus management and optimise the use of their physical resources.

This research investigates the dual scale position of "campus as real estate object" within the real estate management discipline in order to improve the management of a specific campus in Bogotá ,Colombia: The University City. Therefore, its results are aimed to campus managers with the objective to improve the management of UCB's physical resources according to available internal and external tools from theory and practice applicable in a specific context. Likewise, the findings of the analysis carried out trough the case study in Bogota could be useful for campus and city planners in this context when aligning planning processes.

This chapter will provide an overview of the background and motivations of this research, starting with an introduction of the pilot case study, object of this research, in order to highlight its relevance related with the problem statement. Furthermore, the hypothesis, research questions and previous findings will be outlined.

1.1 Background

About Managing the University Campus

Previous and current research in this field has been carried out by the researcher Alexandra den Heijer within the Real Estate & Housing department at TUDelft in co-operation with campus planners of all Dutch universities called "Managing the university campus". Accordingly, this research provides universities with conceptual model and tools to improve campus management, for both strategic and operational questions, connecting orientations of different stakeholders and creating shared responsibility for campus planning, at the same time generating university-wide support for campus decisions. (Den Heijer, A., 2006). For instance, the insights provided by this study, in form of ideas, models and tools available in existing literature are the basis for the theoretical approach and orientation of this research.

Particularly, two papers were the starting points in formulating the research questions which are found in the compilation "Corporations and cities colloquium" (Brussels, 26-28 May, 2008): *"Envisioning Corporate Real Estate in the Urban Future"* (Jonge, H. de and Heijer, A. den, 2008) and "*Managing the University Campus in an Urban Perspective: Theory, Challenges and Lessons from Dutch Practice"* (Heijer, A. den, 2008). Accordingly, both papers focus on the relation between the accommodation of large scale organisations -such as universities- and urban planning. Indeed, the second paper outlines the complexity of campus management since the decision making process involves many internal and external stakeholders. However, the author addresses that their relationship might differ according to their own interest and local socio-cultural conditions: "*The challenge for campus management is connecting their different orientations and creating shared responsibility for campus planning, at the same time generating university-wide support for campus decisions*".
In this perspective, it is imperative to understand the position of university as "institution" in relation with a specific context and its impact on campus management. Nevertheless, since methods and instruments provided by theory and empirical research are generic, this research arose to test their applicability to solve a similar problem in a specific case: The university City of Bogotá.

About Managing the University City of Bogotá

Previous experience working at the National University of Colombia, Bogotá headquarters -which campus is well known as the University City- has provided to this research preliminary knowledge about the way in which this campus is managed and the current problems faced by this university, which is indeed, comparable with the problems faced by other universities in the Netherlands addressed in the research carried out by Alexandra den Heijer and mentioned above. Besides the available knowledge on this case, why is this campus important? The answer of this question will be addressed in the next paragraph.

Figure 1.1 Genealogy of the University City formation

1867

Approval project of National University of the United Stated of Colombia

1872

The university receives the Santa Ines, El Carmen and La Candelaria monasteries to be adapted for academic functions

1900

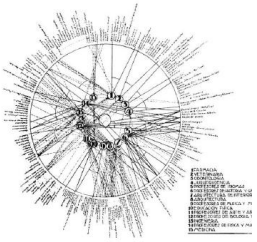
Strengthening of physical infrastructure and construction of three new buildings in different locations of the city centre

1924

A German commission hired by the government defines a State policy for higher education

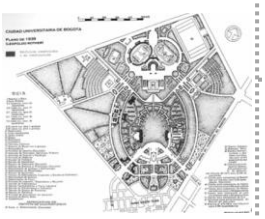
1935

Approval Law 68 by which the University adopted an organisational reform. Acquisition of land to build the University City



1936

The design of the University City is presented according to an academic model per departments



1938

The spatial model is modified by grouping faculties and areas of knowledge

1.2 Relevance of the University City case

The Campus and the idea of university

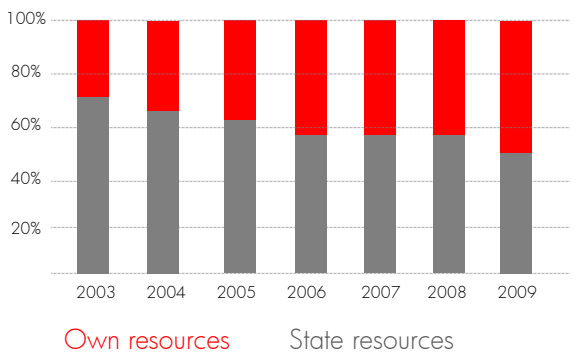
The University City of Bogotá is the name given to the largest and first university campus of Colombia that is one of the most important projects built in the higher education history of the country. The University City project was launched at the beginnings of the 20th century to accommodate the National University of Colombia, which is also the largest and eldest university of the country.

After its foundation in 1867, the university was accommodated in different buildings located in the city centre. In 1872 the university receives from the state three buildings, which were owned by religious orders expulsed of the country, that were adapted to fulfil the academic purposes. Later, at the beginning of the 20th century there was a need to strength the physical infrastructure and three more buildings were built in the city centre to accommodate three faculties. Then, in 1924 the government hired a German commission to define a State policy for higher education, which concluded that the university must integrates its faculties and schools to reorganise the academic structure which required complete autonomy. This commission served as basis for the approval of the Law 68 in 1935 by which the university adopted its organisational reform. Then, in the same year the government acquired 130 hectares of land in the border of the city to build an autonomous place to accommodate the National University of Colombia which is well known until these days as the University City. Thus, the design of the University City was presented in 1936 based in a academic model organised per departments and specialised buildings for academic and administrative purposes. Thus, this last function was concentrated in the faculties in order to make more efficient the educational labour and the built area. However, this model was not accepted by the faculties which considered the proposal a threat for their autonomy. As a result, the design retake an academic division per faculties by grouping the campus in five areas of knowledge; Social sciences, Natural sciences, Arts and Chemistry. Later on, the proposal was modified with the addition of administrative, sport and cultural areas. All in all, this spatial model based in an academic ideal has remained until these days in spite of all interventions and modifications brought for different spatial demands along 64 years of development. The Figure 1.1 illustrates the way in which campus and university are integrated through the construction of the University City as an autonomous place for the development of education and intellectual thinking of a young independent nation.

1.3 Problem statement

The University City of Bogotá is facing two kinds of problems inter-related. The first one is a lack of attention of higher education decision makers at national level which derives in a scarcity of financial resources needed to improve and update the current portfolio according to current and future changes in spatial demands (Figure1.2). Despite the campus managers and planners are aware of that situation, there is a lack of efficient management of their physical resources in supporting institutional goals, which constitutes the second problem. This situation results in a misunderstanding of the actual role of real estate management and consequently missing opportunities for positive effect on institutional goals and visions.

To clarify this context, a hierarchy of problems was drawn up based in a hierarchy of problems developed by den Heijer (2007) about the real estate situation of university portfolios in the Netherlands. As is illustrated in Figure 1.3, it can be said that the problems universities are facing in Colombia are similar than the problem educational institutions are facing in the Netherlands. According to den Heijer, similar problems were evidenced in the United States more than 15 years ago. However, while in the Netherlands the diminishing of financial public involvement is a recent issue; in Colombia it has been a constant the campus managers has faced during the last three decades (SINIES, 2009).
Likewise, it is highlighted in Figure 3.1 that the two interrelated problems have different and independent sources (internal-external) connecting three key elements of campus management: real estate, institutional goals and stakeholders. However, the external problem is indeed caused by uncertain factors that cannot be controlled from the real estate management side. Meanwhile the internal problem can be solved by using "real estate" as a mean to optimally use the financial and physical resources of the universities, in order to support their end institutional goals. Indeed, this is the field in which campus management can play an important role. Accordingly, the problem statement of this research can be reduced as a need of means to make an optimal use of financial and physical resources in order to support the institutional goals and visions of the University City.



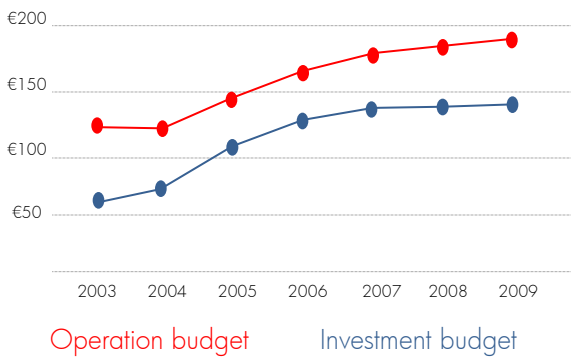


Figure 1.2. Relation of increasing investments and decreasing availability of resources from the State in the UNAL. Source: National Budget directive, UNAL (2009)

1.4 Research question and Objectives

Main question	➔	*How can the UCB improve the management of its campus as a real estate object in order to support their institutional goals ?*

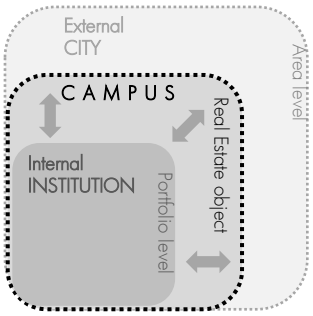
Through this question three relevant components for this research are identified:

(1) The approach of campus as real estate object, which is hypothetically positioned between two scale levels: portfolio and area level (Figure 1.4);

(2) Real estate management as "subject" of the research. Thus, the management field of these two scale levels are CREM (Corporate real estate management) and UAD (Urban area Development) respectively. According to de Jonge (2008), this management fields are complementary. Indeed, campus is a real estate object where the connections of these management levels and their complementary benefits can be visible;

(3) The University City as "object" of the research in which the research input and output are focused.

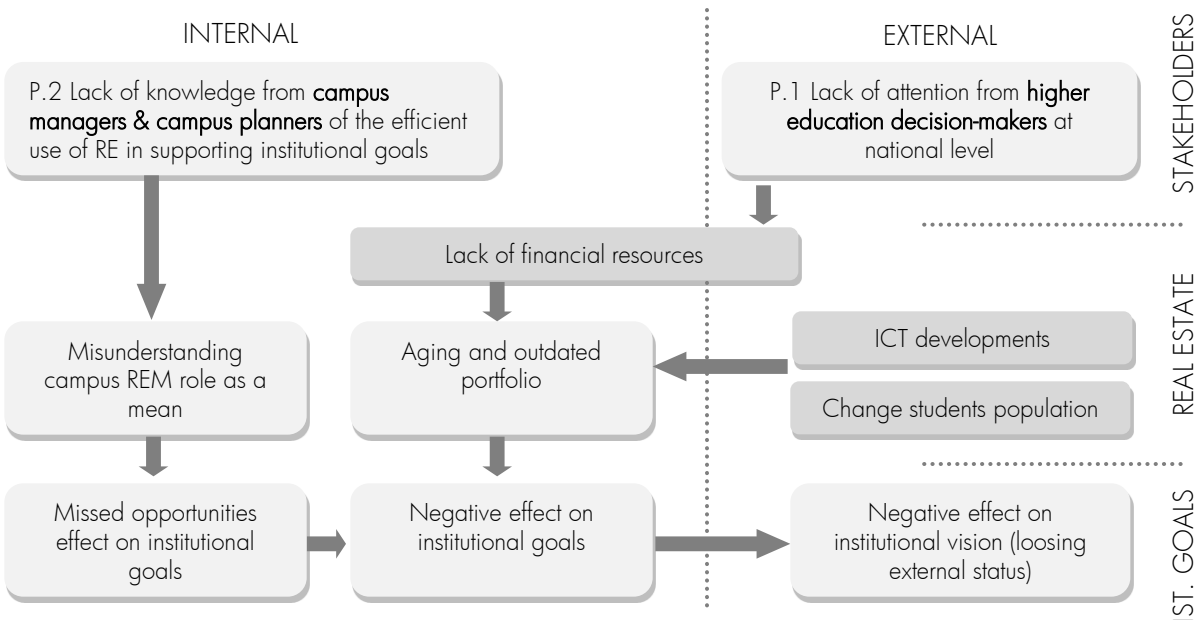
Figure 1.4. Hypothetic approach of campus as real estate object



1.4.1 Basic Assumption

Since this research investigates the hypothetical dual scale position of "campus as real estate object" between area-portfolio levels and its influence in campus management, it is based on the assumption that *the real estate management of higher education institutions with large scale campus is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies´ orientation*. For instance, this research wants to demonstrate how the application of generic Corporate real estate management instruments in specific contexts can be complemented trough the use of urban tools strongly related with socio-economic environments in which institutions are located.

Figure 1.3. Hierarchy of problems of University City campus connecting the three key elements on campus management. Scheme based in A. den Heijer analysis of real estate situation of university portfolios in the Netherlands



1.4.2 Research Sub-questions

In this research, three kinds of sub-questions with different objectives can be distinguished to be addressed during different phases of the research and which answers are presented in different chapters of this report, indeed the first group it has been already answer in the previous part of this chapter:

Background questions concerning the formulation of the problem

•What is the relevance of the UCB in the Colombian context?

•How is the real estate situation of the UCB according to current and future institutional demands?

Note: The answer to these questions are implicit in the previous paragraphs1.2 and 1.3 within this chapter

Exploratory questions concerning the theoretical framework

•What is the position of "campus" as real estate object within the real estate management discipline and what can be learnt from it in order to improve its management?

•Which established CREM instruments (in theory and practice) can be used to improve real estate management in universities and a specific context?

•In which way urban factors influencing campus development can be used as complementary tools to improve its MGT?

Note: The answer to this questions are presented in Chapter 3

Analytical questions concerning the practical research

•How to make complementary use of this both areas of expertise where campus as real estate object is positioned?

•How campus is managed in the UCB? What areas need to be improved?

•Which management tools could be transferred from best practices as references to improve campus MGT in the UCB?

Note: The answer to this questions are presented in Chapter 4

← Objective1

To contextualise the research with an actual problem that can be solved trough real estate management.

← Objective2

(1) To define and understand a context for university campus as real estate object and (2) to identifying the instruments provided for this context which can be applied as frame for analysis in order to improve campus management.

← Objective3

(1) To identify strategic areas for analysis aimed to improve campus management and (2) to test the applicability of complementary instruments provided by the theoretical input

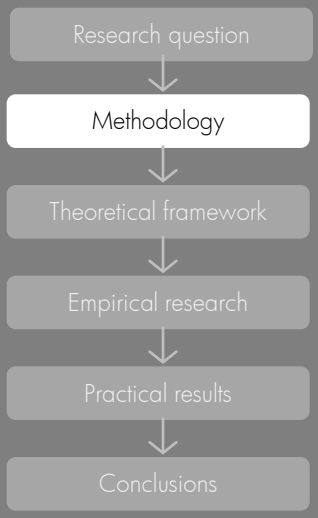
1.4.3 General goal and aimed results

The goal of this research has two facets: academic and practical. First, providing understanding about the role of campus real estate management as mean to support institutional goals in a specific case. Second, providing strategic advice aimed to improve campus management in the University City case in Colombia. Therefore, the targets groups of this study are campus managers and campus planners of universities with similar conditions in the Colombian case.

Accordingly, the intended product for this research is a practical advice in a form of "Strategic plan" aimed to complement the current management plan of the University City in Bogota. Furthermore, a concluding chapter for the final report will include general recommendations and academic insights about the applicability of CREM instruments and concepts in a specific urban context. To illustrate the double facet of this research, the goals and end products are presented below (Figure1.5)

Figure 1.5 Research goals and results

2 Chapter two
Research Methodology



"This is a qualitative research with a practical orientation focused on a specific situation strongly associated with its context. Therefore, the particular quest for qualitative information uses literature study and single case study as primary methods combined with other tactics such as interviews and multiple review of existent case studies"

This chapter provides a description of the methodology that has been used to test the basic assumption of this research. For instance, it addresses specially the way in which the research is conducted in order to answer the multiple research questions already mentioned in previous chapter. In short, attention is paid to the overall research design model with its phasing; the methods used during the exploratory and analytical phases; and the collection of empirical data.

2.1 Research Design, methods and techniques

The design of this qualitative research is organised in four phases linking the research questions, components and methods: (1) Descriptive, (2) Exploratory, (3) Analysis, and (4) Synthesis. For instance, in order to answer these research questions, appropriate methods and techniques were conducted during the two central phases of this research: exploratory and analysis phases (Figure2.1). Accordingly, two primary methods were used in the following order:

Literature Study

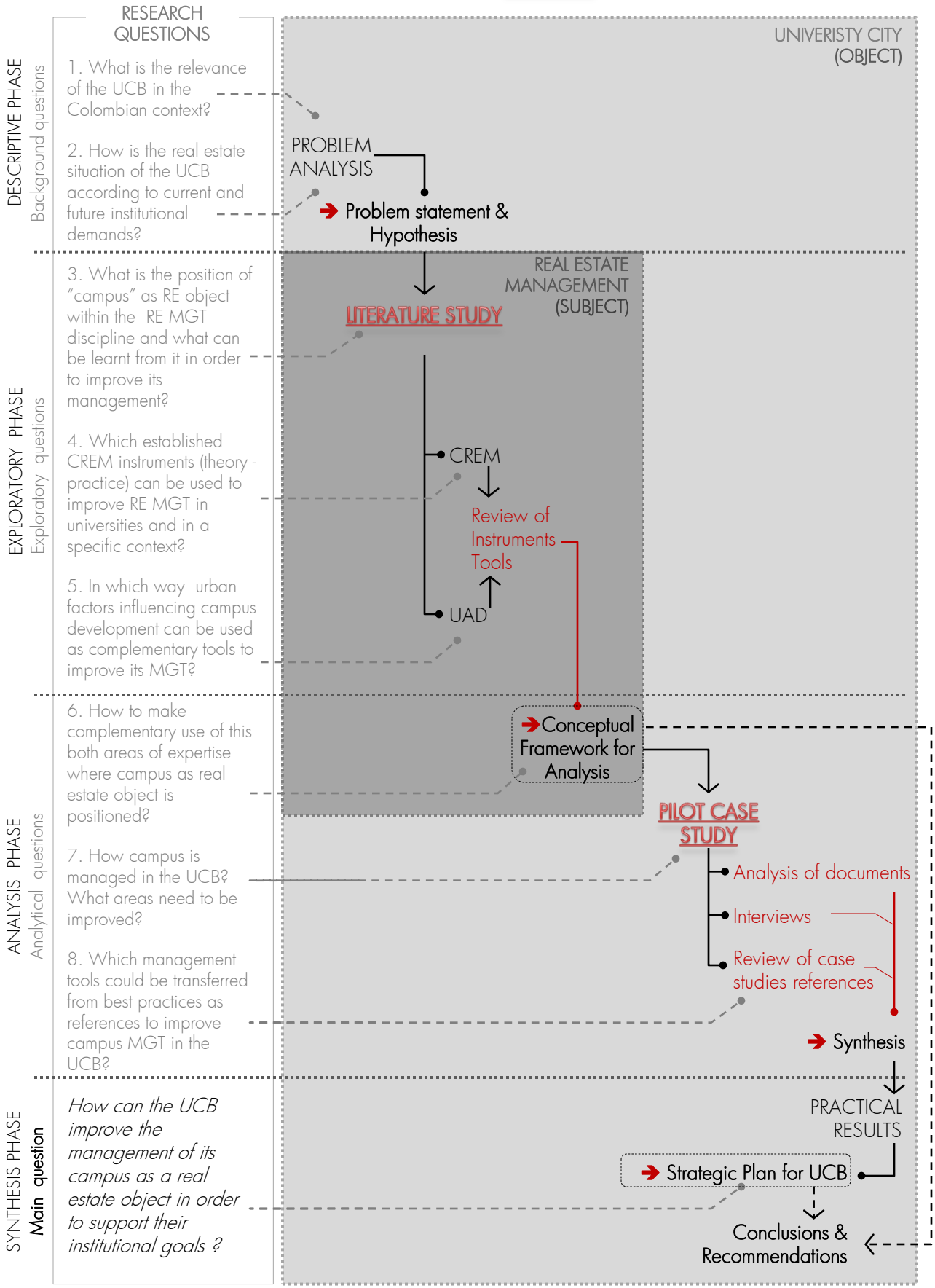
This method provides theoretical frame to this research and its hypothesis by connecting the exploratory questions with existing knowledge on the established research subject: real estate management. In this sense, it provides the main input from theory which output is a conceptual framework for analysis capable of application during the next research phase. For instance, the hypothetical approach of "campus as real estate object" within the real estate management discipline, establishes two management fields for this literature exploration: corporate Real Estate management (CREM) and Urban area Development (UAD).

Tactics and data collection: These management fields defined as areas of study for this research were conducted as primary and complementary sources. First, CREM as primary source was conducted through the review of instruments from theory and empirical research in different contexts. Indeed, this review was limited to available CREM readers, papers and books published by the Real Estate & Housing department at TUDelft and research papers available at the e-Journal of Corporate Real Estate (JCRE). Second, UAD as complementary source was conducted by searching topics related with the urban position of higher educations institutions and its influence on campus management such as Knowledge economy, Knowledge City, Universities and Cities, Creative Cities, etc. In this sense, the review was limited to available research papers and essays about campus and cities available in books, e-Journals and free databases. Indeed, the Lincoln Institute of Land Policy is one of these databases that offer a complementary and relevant research field for this study: University Real Estate Development (URED).

Pilot Case study

This method provides empirical context to this research by testing the applicability of the mentioned theoretical output in order to answer the analytical questions linked to the established research object: the University City of Bogotá. For instance, it constitutes the most extensive phase of this research since it is approached in two hierarchies focused first, in a in-depth single case study; and second, a parallel review of existent case studies from empirical researches as references to improve campus management.

Figure 2.1. Research design COMPONENTS • METHODS • tactics • ➔ outputs



Tactics and data collection: In first place, the pilot case study is conducted through the analysis and evaluation of the UCB's campus management. This includes (1) historical and descriptive analysis of data, (2) review on current urban settings and impacts, (3) review on main future developments affecting campus management in a broad sense and (4) review on their current management plans and policy. Thus, the ample analysis and evaluation was possible due to the large amount of available information on the official institutional websites such as the current policies and plans, institutional documents, reports and statistics databases of higher education in Colombia. Furthermore, interviews with different internal stakeholders of the University City of Bogotá were included in this set of evaluation tactics, which took place during a study trip to Bogotá realised during the early weeks of this research phase, which was at the same time an opportunity to collect official complementary data provided directly by the UNAL, the district authority offices and other institutes, not available for public online consultation.

In second place, an open and exploratory review on existent case studies related to topics such as "university development" or "higher education institutions in its urban context" from previous empirical researches, was conducted in a parallel manner with the analysis of the pilot case study, with the aim to be used as references from other contexts to improve campus management. In this way, the review of related case studies not only provided references from practice but generic frameworks to analyse the context of the pilot case study suitable to identify relationships between the cases through comparison. Nevertheless, the review of this case studies was limited to available empirical researches at hand and recommended by the mentorships of this research, among which it is imperative to mention the following:

•"European cities in the knowledge economy" (van den Berg, L. Ed. et al. 2005) ➔ Location case studies: Europe

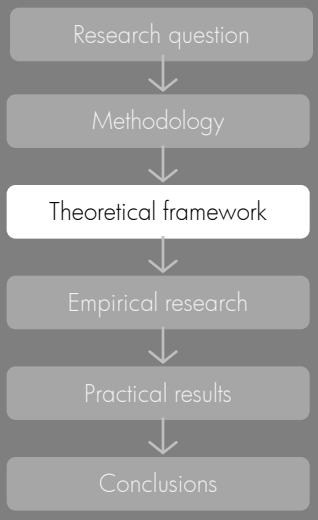
•"Global Universities and urban development: case studies and analysis" (Wiewel, W. and Perry, D., 2008) ➔ Location case studies: North America, South America, Europe and Asia

•"The student city. Strategic planning for student communities in EU cities". (Berg, L. van den & Russo, A., 2004) ➔ Location case studies: Europe

Furthermore, the selection of cases studies as references was based on examples from practice in which the application of campus strategies, policies or even initiatives were relation of universities with their urban context is successful, and therefore support the basic assumption of this research.

Interview structure: due to the informal character in which the interviews took place, the structure was based on different open questions according to each respondent. In fact, most of the questions address the current and future perspectives on the physical resources of the campus, its management process and the available strategies involving its physical development, which can be found in Appendix III.

3 Chapter three
Campus as a real estate object



"University campus as real estate object possesses two singular conditions which define the orientation of its real estate management and therefore the focus of its real estate strategies: the character of universities as "institutions" and the large scale size of their accommodation, which certainly bring complexity to its management by adding urban demands tied to their socio-economic contexts"

This chapter summarises the major findings obtained through an in-depth literature study on the two complementary management forms of stock and area scale levels in which real estate objects is hypothetically positioned: Corporate Real Estate Management (CREM) and Urban Area Development (UAD) respectively. The theoretical approach is made under the assumption that the complementary use of instruments provided by both research fields are aimed to improve "campus management". For instance, it will address the answer of three exploratory research sub-questions followed by the main input of this research phase which is the theoretical framework for analysis on campus management.

3.1 Findings from theory

This essay is the result of the interrelated real estate management theories involved in the main research question of this research, which hypothetic approach of campus as real estate object, provides with feasible instruments to solve the main problem of this research. Therefore, as it was outlined in the introductory part of this chapter, the relationships between the two mentioned management fields are measured through answering three exploratory research sub-questions outlined as follows.

A. What is the position of "campus" as real estate object within the real estate management discipline and what can be learnt from it in order to improve its management?

The findings in both research fields (CREM and UAD) have supported the hypothetic positioning of university campus as real estate object within two scale levels: portfolio and area. This position is mainly based on the combination of the physical large scale of university's accommodation and the social relevance of university as institution, especially public universities (Figure 3.1). Accordingly, this particular condition outlined during the literature review has revealed that campus real estate management and its areas of practice (acquisition, development and financing) has to deal with different layouts such as society, individual and organisational demands. For instance, the findings have shown that in order to improve campus management it is important:

•To know the way in which the management of the campus is structured and how the different perspectives and aspirations of internal stakeholders match to support the institutional higher goals and visions.

•To know the way in which universities is linked and creates new relationships with different external stakeholders such as the private sector, city and community to make campus management plans work.

•To know the real estate situation and value of campus at portfolio level from the functional and property points of view.

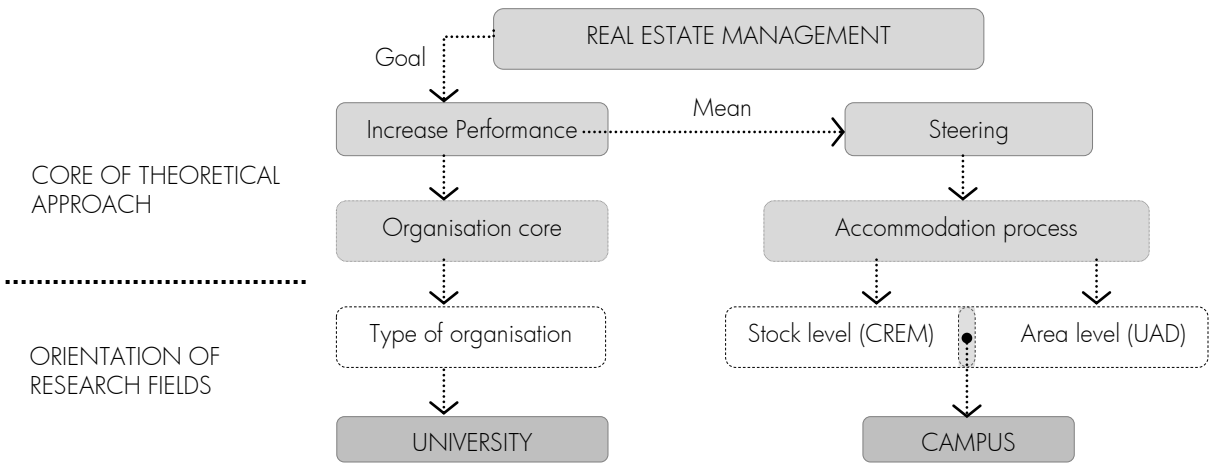
•To understand mechanism universities use to take real estate decisions as well as finance their real estate transactions.

•To identify the management areas for improvement and to compare with appropriate cases as successful references available in practice.

➔Basic theoretical insight

Real estate object is a recognisable unit of real estate (a building, a plot of land, etc) which contains specific characteristics with regard to its suitability, value, maintenance costs, proceeds, possibilities of refurbishments, and such like. It never stands alone but forms an integral part of a context: is situated in a location, it belongs to an architectural style and typology, it is used by a specific organisation, it has an specific form of funding and belong to an specific stock. (Jonge, H. de, et al., 2007)

Figure 3.1. Hypothetic position of campus as real estate object supported by theoretical insights



B. Which established CREM instruments (theory -practice) can be used to improve real estate management of universities in a specific context?

The scan in theory and practice has showed that all instruments on CREM are suitable to align corporate real estate with corporate goals and strategies. Nonetheless and according to Ilsjan, V. (2007) strategies and tools justified in more developed markets could limit development in smaller environments, and therefore, should not be transferred automatically. Likewise, the measures should derive from firm's strategy and the organisation's success factor. (Ghalayini and Noble, 1996). Since organisations are structured in different ways and focused in different goals, the measurement of performance for identifying the generic added value of CREM is difficult. However, it is possible to identify different kinds of measures for different kinds of organisational objectives and success factors.

For instance, the selection of instruments aimed to improve campus management for organisations such us universities in a specific context, distinguishes the parameters (P) presented as follows which are driven by on specific factors:

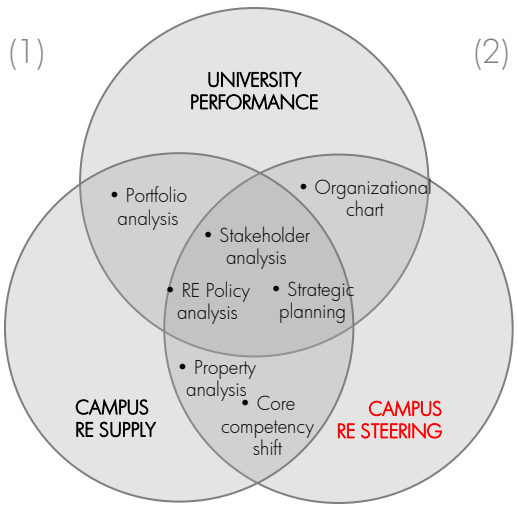
- P1- Society as a context for demand: which constitutes the distinct profile of the organisation that in this case, is university as institution;
- P2 - Portfolio level: which is the scale of application of the instrument, which for real estate objects such as campus do not take in consideration the ones focused on building level;
- P3 - Theory and practice sources: to measure the limitations and applicability of the instruments. For instance, this research takes in consideration the instruments that have theoretical roots and at the same time have been applied successfully in practice;
- P4 - Analysis of both CREM and RE: which constitutes the purpose of use of the selected instruments. since this research is aimed to improve campus management in a specific case it is necessary to know what and where to improve.

Accordingly, seven CREM instruments were selected and framed within three basic areas to improve campus management from an internal perspective: university performance, campus real estate supply and campus real estate steering . For instance the instruments are connecting this areas where they complementing each other:

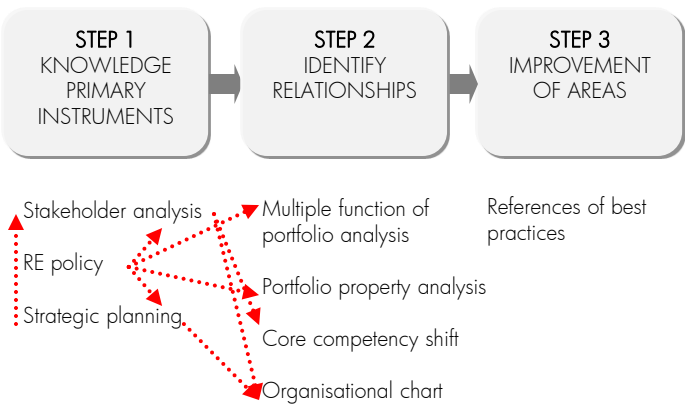
➔CREM insight

In scheme (1) below, the seven instruments has been positioned. Indeed, three primary CREM instruments have been identified for campus management analysis (Stakeholders analysis, real estate policy analysis and strategic planning). All three instruments are covering the three areas related with the improvement of campus management and can be used in combination with the other five CREM instruments that have been classified as complementary. For instance, three steps for analysis have been drawn up based in this prioritization of instruments and their relationships in scheme (2).

(1)



(2)



C. In which way urban factors influencing campus development can be used as complementary tools to improve its management?

All practical implications of the urban role of university have shown an increasing complexity of its real estate management due to the position of them in the city. Some authors (Berg, van den et al. 2004) have outlined that strategic planning targeting student community is necessary for the well being and competitiveness of the city described as a "symbiotic relationship". Indeed, this symbiosis between universities and cities has brought more stakeholders both at individual and collective levels to the campus making-decision process. Likewise, the literature review has permitted to identify a large number of factors influencing campus management, among which these are the more relevant or at least the most frequently mentioned by different authors:

- Education, R&D as city function generating economic growth and the counter-cyclical role of university for economic regeneration strategies
- Large-scale accommodation of universities and its long-established feature in cities
- Increasing mobility and ICT developments
- The knowledge workers as factor to economic growth in a spatial context and the presence of student communities as strategic resource for urban development
- The existence of a collaborative partners' network in location
- The existence of a collaborative partners' network in similar process
- The historic chain between institutions and cities influencing each other's developments
- The campus urban setting and their physical and social relationship with the immediate surroundings
- The multiple functions allocated within university campus and student community behaviours towards their surroundings
- The key position of universities as player in local economic activities and driver of urban developments
- The changes in cities growth patterns
- The impact of student community settlements on the housing market

These factors have different impacts on campus management and sometimes are overlapped. However, they -separately- define five main roles of interaction between universities, urban actors and agents of change within the city: (1) University as relevant function for city's economic growth; (2) Universities as engine to create attract and retain knowledge workers – Value in the regional knowledge economy; (3) Universities as nodes in a collaborative network; (4) University as a city within the city – a symbiotic relationship; and (5) University as real estate developer - agents of urban changes.

UNIVERSITY ROLE		SCALE IMPACT & MEASURES		
		neighbourhood	district	wide city
1	Relevant function for city's economic growth		X	X
2	Engine to create attract and retain knowledge workers		X	X
3	Nodes in a collaborative network	X	X	X
4	City within the city - a symbiotic process	X	X	
5	Real estate developer	X	X	

High perceived impact

Moderate impact

Less perceived impact

← UAD insight

For instance, the challenge for managers is to exploit the available resources and their steering abilities to make efficient use of these positions or roles. Thus, a systematic way to make use of the role of universities in the city in order to improve their real estate management is defining the scale level of their impacts. According to Perry, D. and Wiewel, W., (2005), the university real estate practices engage such processes at key scale levels of urban spatial development, including neighbourhoods that surrounds the university, the development of urban core or downtown business district, and larger city wide development strategies of which university-city collaboration is meant to be a part.

According to the previous scheme all university's roles have impact on campus management in at least two urban scale levels. Likewise, all of them have an influence at district level. However, roles 1 and 2 are wider city oriented and for that reason their impact on campus management is less perceived and more difficult to measure in real estate management terms. In this sense, depending on the scope when analysing campus management from an external perspective, one can narrow the analysis to neighbourhood and district levels by using roles 3, 4 and 5 and their measures for improvement to define the complementary instruments. For instance, the complementary instruments illustrated bellow are: mapping, location analysis and area development analysis that will complement the primary instruments (from CREM)

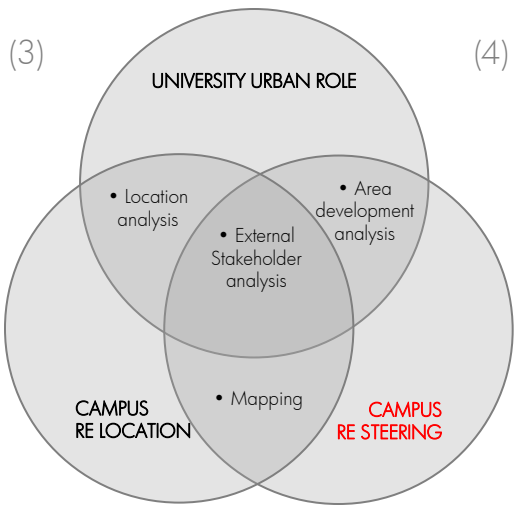
➔UAD insight

In scheme (3) below, the four instruments has been positioned. Indeed, one primary urban instruments have been identified for campus management analysis (External Stakeholders analysis), which is covering the three areas related with the improvement of campus management and can be used in combination with the other urban instruments that have been classified as complementary. For instance, three steps for analysis have been drawn up based in this prioritization of instruments and their relationships in scheme (4).

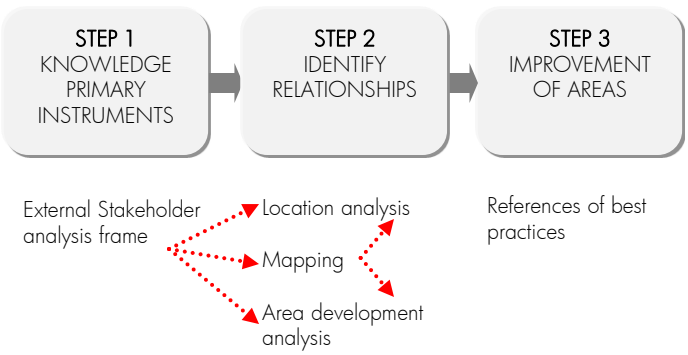
ROLE UNIVERSITY		MEASURES TO IMPROVE CAMPUS MANAGEMENT	COMPLEMENTARY INSTRUMENTS
3	**Universities as nodes in a collaborative network**	•Availability of sharing resources and facilities • Selection of partners in location and processes according to functional priorities	MAPPING
4	**University as a city within the city - a symbiotic relationship**	• Analysis campus urban setting and relation with surroundings • Identify conflicts and synergies in physical settings • Evaluate campus spatial plan, expansion policies and role of accommodating students	LOCATION ANALYSIS
5	**University as real estate developer**	• To know city and university land development policies/ land use plans •Identify strategic projects in area •Analysis of student setlements in surrounding area	AREA DEVELOPMENT ANALYSIS

Accordingly, four parameters were selected in order to complement the framework for analysis. All of them have connected by their impact at different scale levels within the city. Likewise, it can be said that some instruments complement each other connecting three basic areas: university role within city, campus real estate location and campus real estate steering. . However, it is necessary to define in which area they complement each other and in which step of the analysis process they can be used.

(3)



(4)



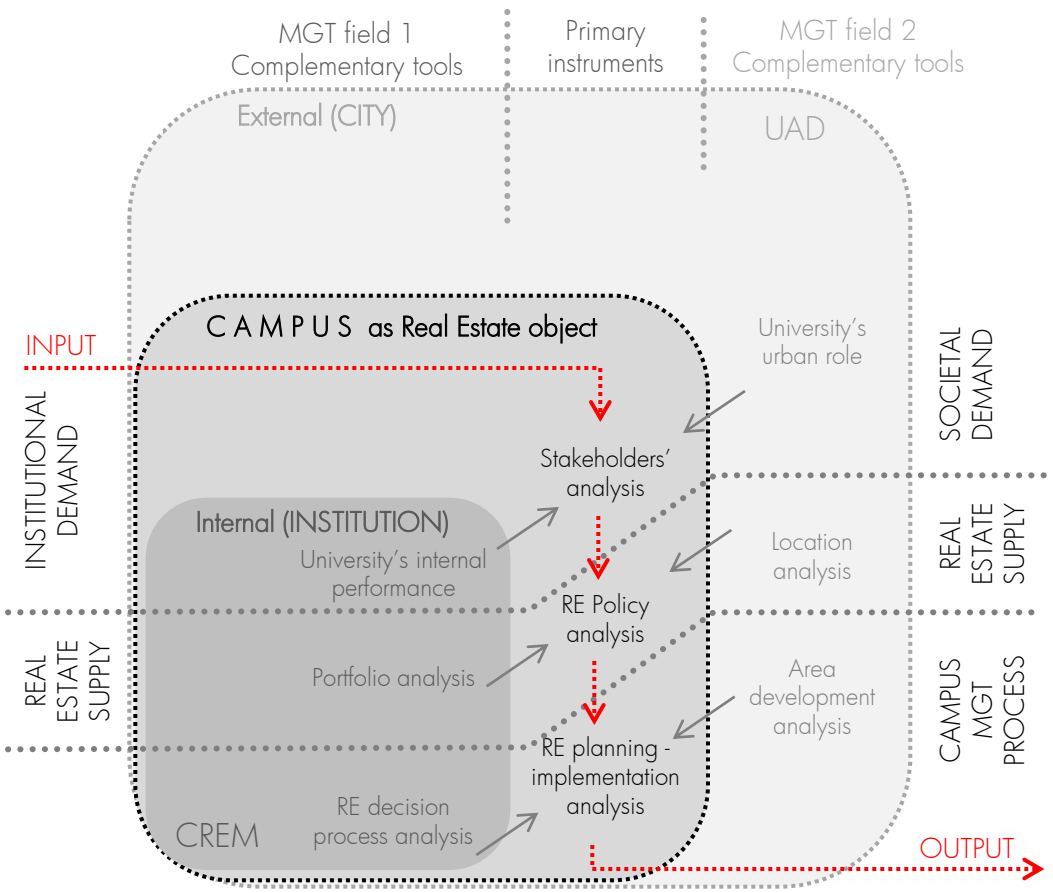
3.2 Conceptual framework for analysis

How to make complementary use of this both areas of expertise where campus as real estate object is positioned?

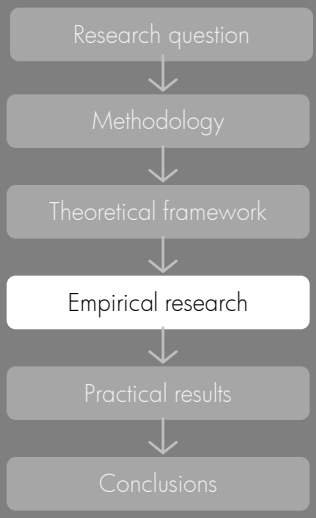
This research develop a conceptual framework to links the previous concepts from literature which establishes evidence to support the need for improve campus management. Accordingly, is the main output from theory, which established relationships between the academic insights, is indeed an individual position to solve the problem of this research and a guideline for the next phase of the study: the empirical research.

As is illustrated in Figure 3.2, the framework is structured by positioning campus as real estate object between its two scale levels and their respective management fields (Portfolio level and CREM – Area level and UAD). For instance, the study of both management fields has defined three primary instruments connecting three main elements related with campus management: (1) *Institutional demand* as main input to improve campus management uses the "Stakeholders' analysis" to define the main interest and goals from the internal and external perspectives that includes societal demands as well; (2) *real estate supply* as mean to support institutional demands uses "real estate policy analysis" to identify the campus's physical and legal conditions at portfolio and area level; and (3) *campus management process* as target for improvement is the main output of this model, which uses "Real Estate Strategy planning & implementation analysis" to identify the campus management roles in relation with internal strategies and external influencing developments. Nonetheless, these primary instruments should not be analysed separately, they are interrelated and each one is complemented by specific internal and external tools defined by the studied management fields.

Figure3.2. Conceptual framework for campus management analysis



Chapter four
The UCB case study



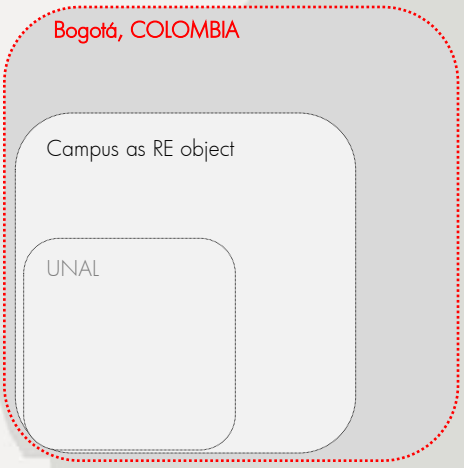
"Certainly, during the last three administrative periods, the campus managers of the UCB has put a lot of attention in the quality of the physical infrastructure to support the institutional vision but a redefinition of their plans is needed according to current and future changes driven by its context "

This chapter presents the description and findings of the Pilot case study, that is framed into the conceptual framework described in previous chapter which applicability is aimed to answer the analytical question on: *How campus is managed in the UCB? And Which areas need to be improved?*

For instance, this framework is tested and applied for the analysis of the UCB case study, which structure the analysis in four sections: Section one provides a socio-economic context for the UCB at national and urban levels, in order to establishes similarities and differences with other contexts where some references to improve campus management are located. The remaining sections are connecting the three main elements to improve campus management presented in the framework; Section two is called "The University City and its institutional vision" driven by the institutional demand side of the framework; Section three is called "The University City and its real estate supply" driven by the analysis of the real estate supply side of the framework at portfolio and location scale levels; and Section four called "The University City and its campus management" focused on the management process side of the framework, which is indeed the target for improvement in this research.

Simultaneously, once identified each area for improvement, this analysis addresses the sub-question: *Which management tools could be transferred from best practices as references to improve campus MGT in the UCB?* . It does so, by selecting a series of initiatives or strategies from existent case studies to be used as references in other contexts to improve campus management.

4.1 The University City context



"*For developing countries success in the knowledge economy requires a change in culture*" Stiglitz (1999)

The transformation of society, as basis for development, has determined differences between countries in adopting global economic basis such as the transition towards a "knowledge economy". For instance, due to the virtual abolition of frontiers and the internationalisation of the economy as a result of globalisation, the shift in the economies of the developed world to "knowledge" as production factor has lead to an adaptation process in the developing world. Therefore, this adaptation differs according to the context defining specific characteristics for adaptation.

In Latin America this shifting process has been recent, spontaneous and discontinuous which still looking for its identity. This characteristics are caused for a cultural barrier represented by conservative positions in the academic and administrative systems. However, this process is not homogeneous in Latin America. Some countries, for example Brazil, had experienced a rapidly adaptation process to this global change. Nevertheless, this shift stills distant from the experience of developed regions and countries where the main problem is the lack of attention and strategic policy facing and supporting this transformation.

Since the instruments for analysis found in literature are justified in more developed contexts, this chapter will provide a descriptive analysis of Colombia and Bogotá -as wide contexts for the University City case- in order to position their performance in the global perspective of the knowledge economy. Thus, the usage of this instruments and references will be measured according this context without limiting its development.

4.1.1 Bogotá in the context of the knowledge economy

This part of the analysis focuses in the urban perspective as wide influencing context for the University City. However, it has a precedent in a descriptive analysis of a national context (See Appendix II) in order to highlight the position and relevance of this pilot case in the Colombian higher education background. The following analysis is framed by using the so-called "Foundations and activities of the knowledge city" developed in the study *European cities in the knowledge economy* illustrated in Figure4.1. Accordingly, this descriptive analysis has the aim of providing a specific knowledge economy context for Bogotá and at the same time identifying the roles and opportunities for universities at wide urban level, specially for the University City case.

Since this research is supported in the basic assumption that *"the improvement of campus management depends not only on internal but external factors"*, it is crucial to identify the network capacity of a city to attain stakeholders cooperation. For instance, this network capacity will determine the achievement of ideas and plans, the generation of funds, etc; in which knowledge institutions can support their campus strategies. Therefore, this urban context analysis is divided in two parts. First, a description of the knowledge foundations will provide an structure of the city of Bogotá in the knowledge economy context. Second, an identification of the activities of the knowledge cities will help to measure how the interaction process is taking place in the city in order to remain successful in the context of the knowledge economy. Therefore, both parts will be assessed according to a qualitative measurement scale given in the mentioned study (van den Berg, L. et al. 2005) in order to draw up some conclusions as well as compare the performance of Bogotá with other cities in Europe which were part of the study previous mentioned.

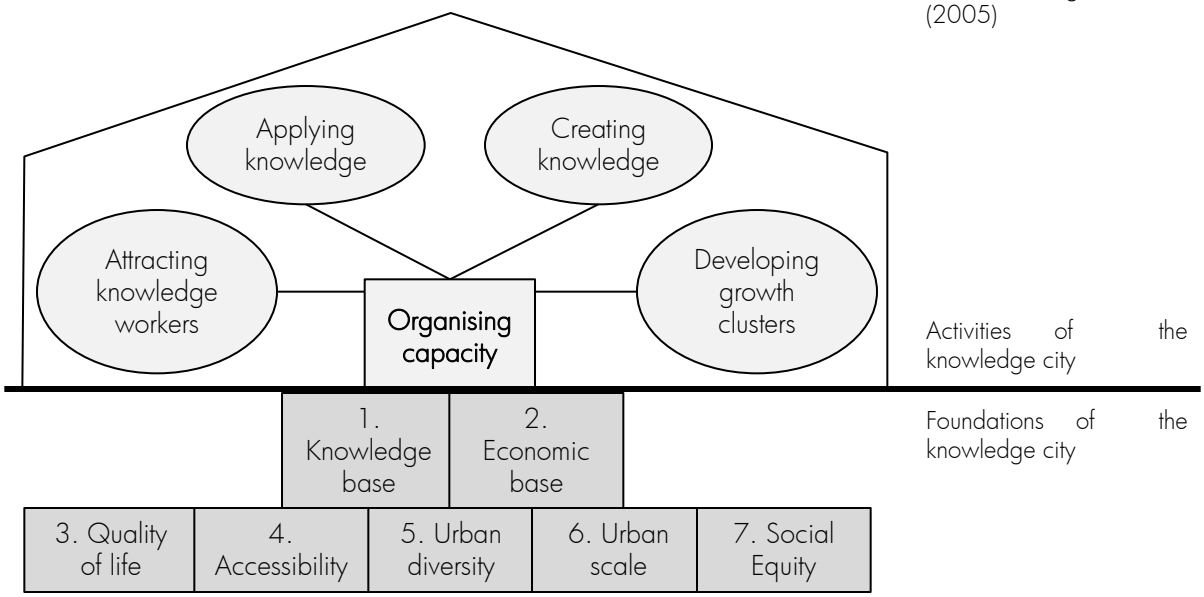


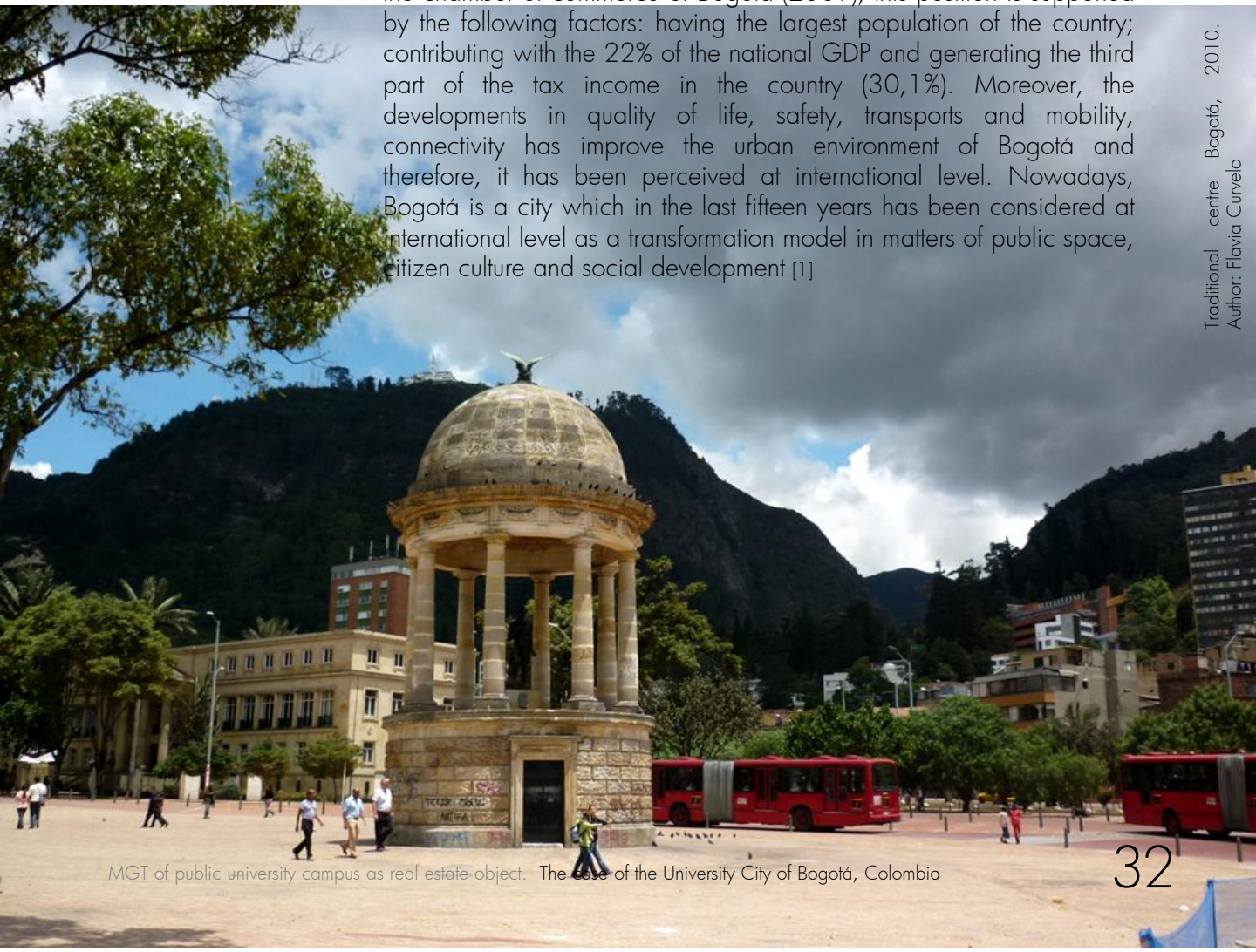
Figure 4.1. The foundations and activities of the knowledge city. Source: European cities in the knowledge economy, van den Berg, L. et al (2005)

Bogotá, D.C.

Introduction

The city of Bogotá, which is officially denominated as Capital District (D.C.), is the capital of Colombia and the department of Cundinamarca, geographically located in Los Andes mountains at 2600 meters over the sea level. This geographic condition has restricted its spatial expansion, since the city was established in a savanna physically limited between the mountains and the Bogotá River. Bogotá is administrative divided in 20 localities where the administrative and politic government is seated. Moreover, Bogotá is the larger city of the country with the highest population (6'778.691inhabitants in 2005) as a result of the urbanisation process that took place in the middle of the 20th century. Besides this, is the most important cultural, industrial and economic centre of the Colombia. Its economy is diverse mainly based in services and nowadays is the largest business centre of the country. In 2005 Bogotá registered 219.000 companies (26% of companies in Colombia) and 13.000 new firms. Likewise, Bogotá is the seat of the main multinationals established in Colombia. In 2006, Bogotá was positioned in place 6 among the 25 best Latin-American cities in doing business (America Economia Intelligence, 2009). According to the chamber of commerce of Bogotá (2009), this position is supported by the following factors: having the largest population of the country; contributing with the 22% of the national GDP and generating the third part of the tax income in the country (30,1%). Moreover, the developments in quality of life, safety, transports and mobility, connectivity has improve the urban environment of Bogotá and therefore, it has been perceived at international level. Nowadays, Bogotá is a city which in the last fifteen years has been considered at international level as a transformation model in matters of public space, citizen culture and social development [1]

[1] For further information consult: *"Dream works: How two mayors broke the mold to rejuvenate their cities"*, Harvard Gazette, January 26, 2010; *"The Big City; Civil Obedience"*, The New York Times Magazine April 19, 1998; and *"The improbable story of how Bogotá, Colombia, became somewhere you might actually want to live"*, Grist Magazine, April 4, 2002



Traditional centre Bogotá, 2010. Author: Flavia Curvelo

Knowledge foundations of Bogotá

Urban scale

Bogotá is the 6th largest city of Latin America with a population of 6'778.691 of inhabitants (DANE, 2005). Nowadays occupies an area of 117.598 hectares distributed in urban area (30.736ha.), rural area (129.815ha.) and suburban area (17.045ha.) (Bogotá.gov.co, 2010). These figures includes only the Capital District, since the Metropolitan area of Bogotá, which is an existent conurbation formed between the Capital District and 17 municipalities, is not officially constituted yet (Figure 4.2). This metropolitan area has the physical conditions to be recognised as such. However, the complexity of the administrative division of this large area is the main barrier for its legal conformation. In fact, the surrounding municipalities do not want to loose their authority and independence since the administrative separation between the capital District and the department is more and more evident. Therefore, according to municipal projections 2006-2020 the estimated population of this metropolitan area is 8'361.000 of inhabitants (DANE, 2005).

The metropolitan area of Bogotá is certainly large enough to qualify as a city with sufficient scale to have all the metropolitan amenities and infrastructures that support the development of a knowledge economy and attract different kind of workers. Nonetheless, this large scale of the metropolitan area can be a challenge for the development of knowledge activities that may not be significant for the economy of the city.

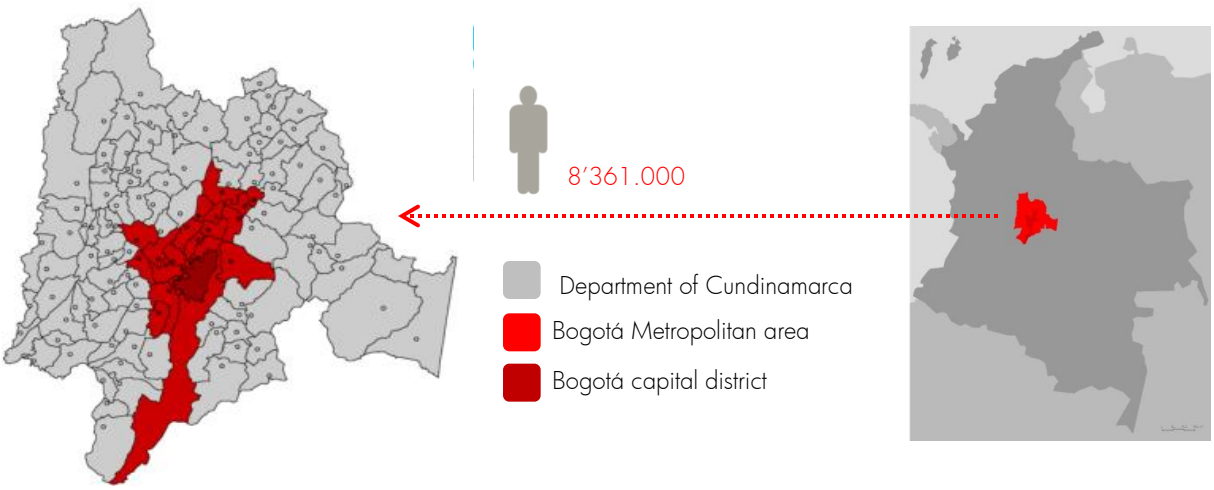
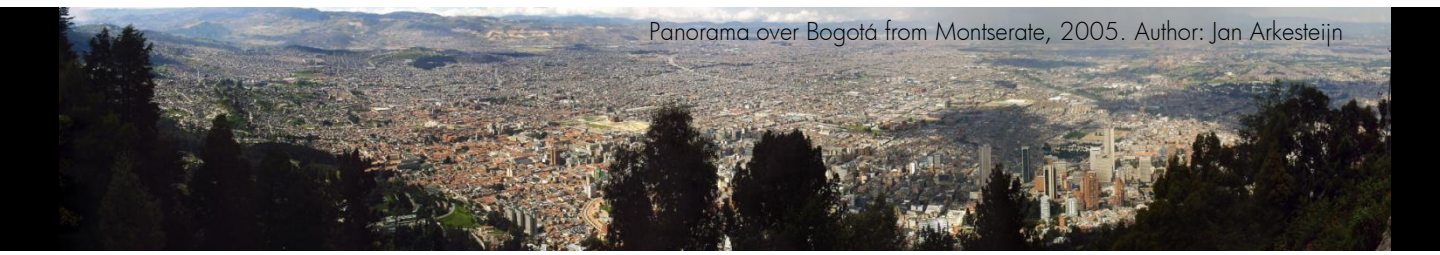


Figure 4.2. Location of Bogotá and its metropolitan in the department of Cundinamarca, Source: District Planning Secretary SDP, 2010



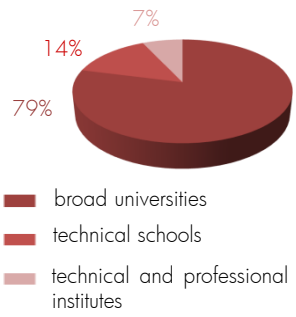
Panorama over Bogotá from Montserate, 2005. Author: Jan Arkesteijn

Knowledge base

Bogotá has the larger knowledge infrastructure of the country with 110 higher education institutions in total which represents 39% of the national coverage. Within this infrastructure, Bogotá counts with two of the three most important universities of the country in research activities: National University of Colombia (public) and Los Andes University (private) as well as other higher education institutions with the best academic standards at national and regional level; Javeriana University, Rosario University, Colombian Engineering School, District University, among others (COLCIENCIAS [2], 2009). The range of formation offered by all institutions in Bogotá is distributed in 79% broad universities, which undertake research and education in a wide range of humanities, sciences, social sciences and arts; 14% technical schools; and 7% technical and professional institutes (Figure 4.3). This institutions accommodates 39% of the total student population of the country and only represents 6.3% of the total population of the city. However, the increase of student population in Bogotá has presented a sustained growth over the inscription rate of 43% between 2005 – 2008 (Figure 4.4)

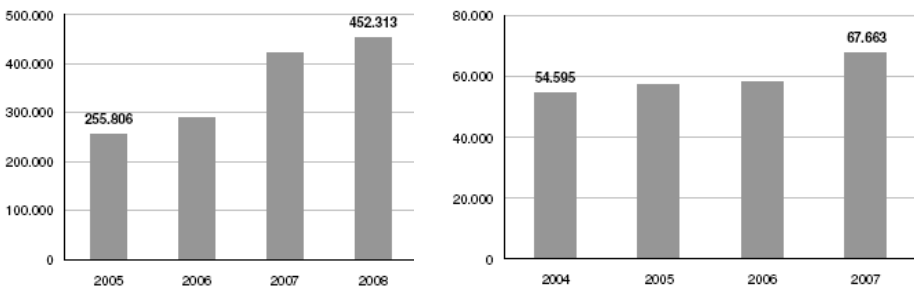
[2] COLCIENCIAS is the Administrative Department of Science technology and innovation of Colombia

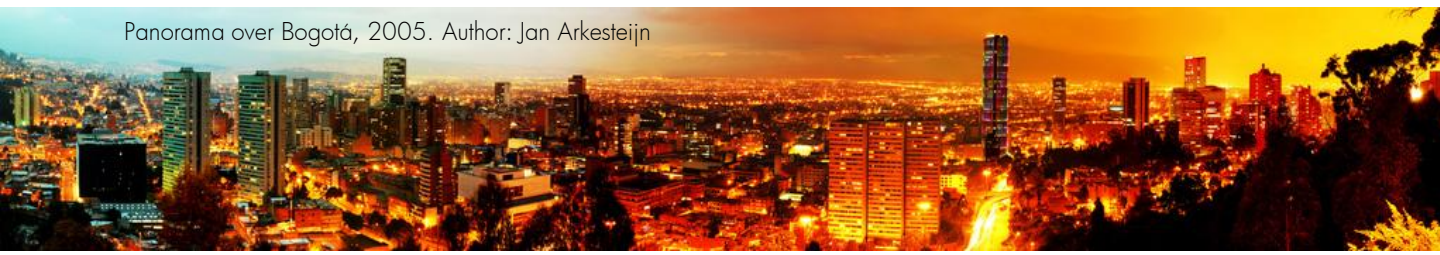
Figure 4.3. Distribution of higher education institutions in Bogotá per type



The creative knowledge base of Bogotá is supported by 6 schools of arts; the Superior Arts Academy of Bogotá and the Guerrero Arts Academy as independent institutions; the Faculty of Arts of the National University of Colombia, the Department of Arts of Los Andes University, the Faculty of Arts of the Javeriana University and the Program of Arts of Jorge Tadeo Lozano University. Moreover, Bogotá counts with two of the four Conservatories of music in the country; the National Conservatory of Music in the National University of Colombia and the Conservatory of the National Pedagogic University. Besides this creative knowledge infrastructure, other programmes such as Film and Television in the National University of Colombia supports the Audiovisual Production as one of the strategic segments with more potential for investment in Bogotá (Invest in Bogotá , 2010)

Figure 4.4. Evolution of students inscribed and graduated 2005-2008. Source: SINIES, 2009





Panorama over Bogotá, 2005. Author: Jan Arkesteijn

Likewise, Bogotá concentrates the largest capacity in Science, technology and innovation of the country: 38.20% of sciences and technology projects approved by COLCIENCIAS in the last 15 years; 76% of the PhD programmes on the country; 40,3% of the research groups recognised by UNESCO; 44,1% of the technologic development centres and the universities' research centres participating in the national networks of excellence in research.(District Policy of Science, Technology and Innovation, 2007)

Economic base

Bogotá accounts for more than 22.5% of the national GDP; 25% of industrial GDP; 38% of financial GDP; and catch 60% of the foreign investment received in the country. However, as well as most of Colombian cities, presents an informality rate higher than 50% and the unemployment rate higher than 12%, despite of the economy of the country has raising over 6% in the last few years [3]

The economy of the city is diverse with an emphasis in services. Accordingly, the main economic activity of Bogotá is distributes in the following segments: 16.88% real estate services; 15.20% Commerce and automobile services; 14.38% manufacture industry; 9.54% financial services; 8.91% public administration and social safety; 6.61% transport, logistic and communication; 4.61% Construction; 4.55% education services; 4.24% social and community services; and 15.20% other services (Figure 4.5).

[3] COLCIENCIAS, Latin-American cities in the knowledge economy. Experiences of research, innovation and creativity, Bogotá, D.C. 2009, p.68

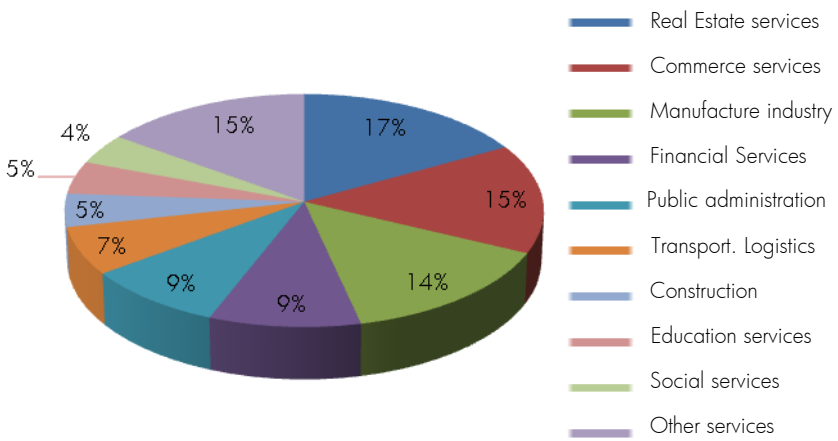
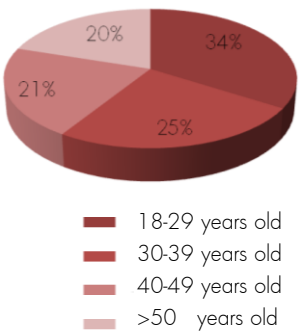


Figure 4.5. Distribution of economic activity in Bogotá by segments. Source: Regional economic report Bogotá and Cundinamarca, 2008

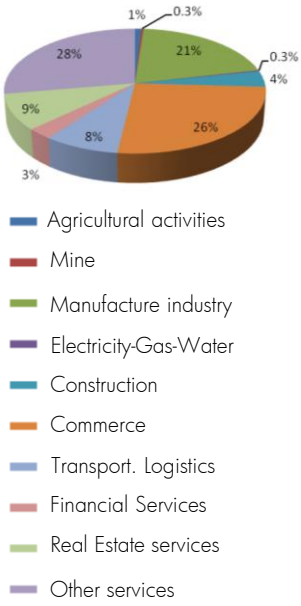
Moreover, the work force in Bogotá is young and qualified with a total of 3,8 million of workers. Therefore, more than 50% of them are between 18 and 39 years old (Figure13). Likewise, 33.6% of the work force available counts with higher academic formation (DANE, 2008). According to the Labour Observatory of graduated students in Colombia, 74% of the total graduated population is linked to the formal economic sector between 2001-2008 distributed by type of degree in the following manner: 67.2% from technical formation; 71.8% from technological schools; 73.2% from universities; 83.1% from specialised programmes; 84.9% from master programmes; and 94.5% from PhD programmes.

Figure13. Available work force per age. Source: DANE, Integrated Households survey, 3rd Trimester 2008



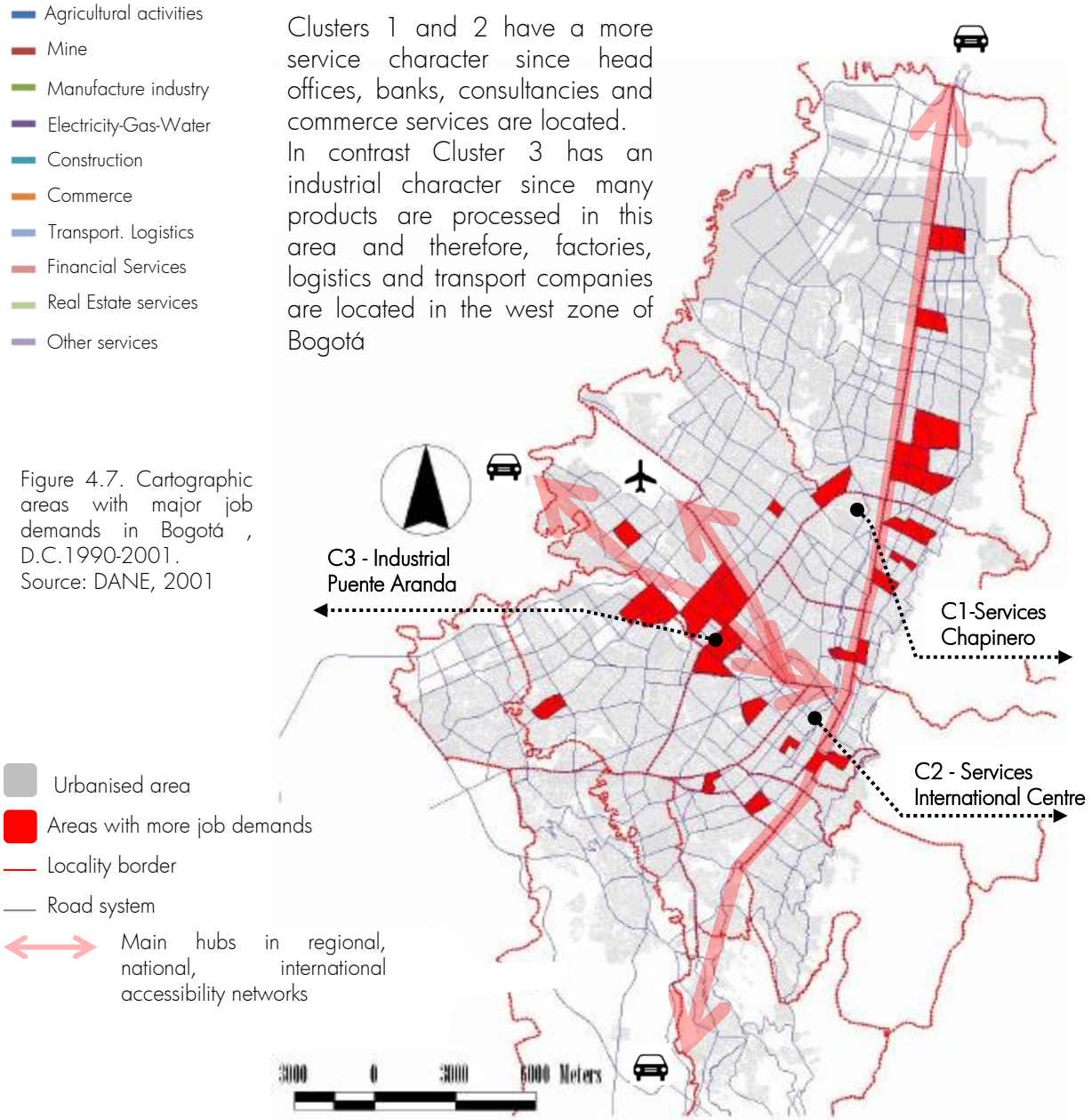
In the same manner, the service, commerce and industry segments generates 74% of the jobs in Bogotá. Other activities such as mine and agriculture present the lowest work supply rates in the city with 0.3% and 0.9% respectively (Figure 4.6). Thus, Bogotá counts with 248 companies (Invest in Bogotá, 2010) which are located in different areas of the metropolitan area. According to a cartographic map of that shows the areas with more job demands (Figure 4.7), three economic cluster are identified in the capital along two axis: (C1) Chapinero and (C2) International centre along the north-south axis of Caracas Avenue-North Highway; and (C3) Puente Aranda industrial area along the East-West axis over 13th - El Dorado Avenues. These locations are strategic within the accessibility network since both hubs are connecting the capital district with regional and national-international networks respectively.

Figure 4.6. Working population per economic activity segments. Source: DANE, Integrated Households survey, 3rd Trimester 2004



Clusters 1 and 2 have a more service character since head offices, banks, consultancies and commerce services are located.
In contrast Cluster 3 has an industrial character since many products are processed in this area and therefore, factories, logistics and transport companies are located in the west zone of Bogotá

Figure 4.7. Cartographic areas with major job demands in Bogotá , D.C.1990-2001.
Source: DANE, 2001



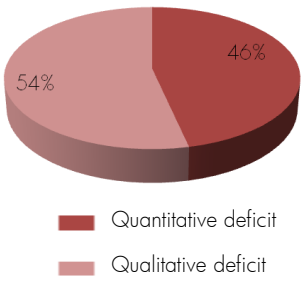
The supply of leisure activities and cultural facilities in Bogotá is broad. The city counts with 8 museums, 20 public libraries, 45 theatres, 62 art galleries and more than 200 Cinemas. In order to support this infrastructure the district organises events that also attract national and international visitors such as the Iber-American Theatre Festival, which is one of the largest independent theatre festival of the world and in 2008 attracted companies from 45 countries and an estimated audience of 3'000.000 people; the "Rock al Parque" is the largest outdoors rock festival in Latin-America, convoking an audience of more than 250.000 people during three consecutive days. Besides, every Sunday and Holiday, the city closes120 kilometers of main motorways for seven hours and 1,5 million people of all ages and conditions come out to ride bicycles, jog, to appropriate their city. "La ciclo-vía" , as is widely known, has been appreciated in other contexts and has inspired projects in other cities like the "Summer Streets" in New York (Invest in Bogotá, 2010). The city of Bogotá has been experiencing a dramatic change in the quality and safety of its urban area since the mid 90's. This was an initiative of the Major in that period, which was interested in "building a city not for business or automobiles, but for children and thus for people". Accordingly, the city restricted car use and invested in high-quality sidewalks, pedestrian streets, parks, bicycle paths and libraries (Grist magazine, 2002). After a deep cultural change in society, the city starts to invest in infrastructure for new citizens, more conscious of their role in urban development. Nowadays, the city has more than 4.000 public parks of different scales; 303 km of bicycle paths, which is the largest in Latin-America; and better public space which has increased the quality of life of millions of people.

International centre Bogotá, 2010. Author: Flavia Curvelo

IberAmerican theatre festival, 2010. Author: Creative Commons

In spite of Bogotá has a favorable living environment, the quality of the housing market is not positive. There is a quantitative and qualitative deficit of housing [4] in Bogotá as well as most of the cities in Colombia (Figure 4.8) due to socio-economic aspects such as the increase of population; the scarcity of urban land available; low income of large part of the population (42,7% of total households); and high poverty rates (DANE,2005). These conditions have resulted not only in an increasing demand but in a shortage of housing facilities and therefore an increase of rental prices since most of the population cannot afford the cost of a new house and are forced to rent. This last issue has generated an informality of the rental market since most of the households do not count with the legal and economic requirements to enter in a formal housing market, which also apply for students coming from other regions. As a result, there is a private and mostly informal supply for student accommodation provided by individuals in the areas surrounding HEI's. Moreover, the informal characteristics of the rental market do not offer a good quality of the student accommodation, which relevance is not assumed yet by private parties neither by universities. Thus, this contrast in the city can be a barrier for attracting students and retaining knowledge workers.

Figure 4.8. Distribution of housing deficit in urban areas at national level. Source: DANE, 2005



[4] The qualitative deficit is measured by the percentage of dwellings with very low building quality such as inadequate floors and walls to fulfill the basic shelter needs.

Figure 4.9. Strategic location of Bogotá in the continent. Source: Invest in Bogotá, 2009

Table 4.1. Flights from Bogotá. Source: Civil Aeronautics in Colombia, 2009

Destiny	Flight time (hrs)	# per day
Atlanta	05:04	1
Buenos Aires	06:16	2
Caracas	01:50	4
Mexico	05:45	3
panama	01:30	6
Fort Lauderdale	03:30	2
Houston	05:17	2
Lima	03:00	6
Los Angeles	07:45	1
Madrid	10:00	4
Miami	03:30	5
New York	05:30	4
Paris	10:20	1
Quito	01:10	4
Santiago	05:40	2
Sao Paulo	05:00	2
Toronto	06:10	1

Figure 4.10. Bogotá as natural hub in the regional network at national level. Source: Invest in Bogotá, 2009

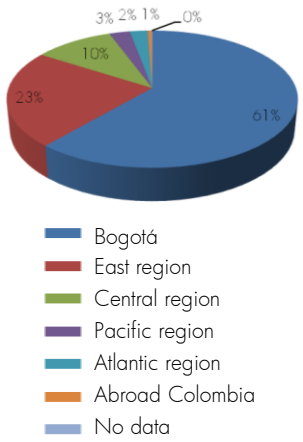
Bogotá has a centric position that has permitted a well connection of the city at international, national and regional. First, at international level Bogotá is strategic located in the heart of the continent, connected to New York, Mexico and Sao Paulo at just five hours by plane (Figure 4.9). It counts with an excellent air connectivity by having a considerable number of daily flights towards the main Latin-American cities (Table 4.1). Second, at national level Bogotá has also a central position in a logistic hub connecting the different regions on the country (Figure 4.10). However, due to its geographical condition in the mountains, this connectivity take place mainly by road and plane. Third, at regional level the metropolitan area is well connected by motorways and by train. This last connectivity is called "Proximity train" since is only connecting few municipalities within the existent metropolitan area. However, it has a poor infrastructure that nowadays is matter of discussion between the Municipality of Bogotá, the Department of Cundinamarca and the Ministry of Transport, who presented a strategic projects to improve the quality of this infrastructure.

As a result of the market liberalisation and the large investments of the private sector, Bogotá counts with a telecommunication infrastructure of high quality. Nowadays, more than 6 private suppliers offer corporate telecommunication solutions. Moreover, the connectivity of Bogotá is redundant through five international submarine cables. Therefore, in terms of internet diffusion, Bogotá has a competitive advantage in the Latin-American context, since it is positioned in the fourth place among 46 cities of Latin-America (Commerce Chamber of Bogotá, 2009)

Urban diversity

The composition of the population in Bogotá is diverse, since the urbanization process in Colombia has generated a migration from different regions of the country to major cities for socio-economic reasons. Therefore, the economic leadership position, the geographic and climate conditions as well as the quality of life, has positioned Bogotá as one of the most attractive cities to live in Colombia. Therefore, the immigrant population in Bogotá is 31.2% which mainly come from other regions of the country and only 0,5% of the population comes from abroad. The distribution of the residents according to their origins is shown in Figure 4.11. Likewise, 36% of the population is young and categorised as "likely to start higher education formation". This indicator is used by the Bogotá Secretary of Wealth to indicates the potential of specific groups within the total population. It means that Bogotá counts with more than 2,4 million of people between 18 and 24 years old available to access to education (District Planning Secretary, 2003). Nevertheless, the origins of the student population in Bogotá is not well documented. Only the National University of Colombia [being the university of Bogotá with the larger coverage of students at national level] possesses data that can be used as reference for the city. Accordingly, 70% of the students inscribed lives in Bogotá and the rest comes form different regions of the country, mostly from the Central region (Admissions Department UNAL, 2004). Besides, Bogotá counts with 60% of the total native students in the country (1.200 of 2.000 native students). They mainly come from different native communities located in isolated regions in the country such as Pastos in Nariño; Nasas in Cauca; Wayuu in La Guajira; Mamentsas in the Putumayo; and Arhuacos in El Magdalena. In spite of this diversity of inhabitants which is appreciated in Bogotá, since they are a source for economic diversity and the big scale of the city allows large level of tolerance, some immigrant population becomes also a source of problem. This relate to the displaced population that have move to the city for social problems such as violence in rural areas. For instance, their emergency conditions and the incapacity of the State in bringing immediate solutions, have forced them to establish in the city under informal ways of living and working. Therefore, the socio-economic differences in the city are threats for urban integration as key challenge for urban development.

Figure 4.11. Resident population in Bogotá according to their birth place. Source: Red Bogotá, 2003



Native Arhuaco in El Magdalena
Author: guiadelcafe.com 2010

Native Wayyuu in la guajira, 2006
Author: alejocock.flickr.com

Social equity

Bogotá is socio-economic divided in Layers from 1 to 6 which indicates the income level of the households, considering 1 as the lowest and 6 as the highest. Likewise, this socio-economic layers are translated in urban layers in which the city is divided (Figure 4.12). The data provided by the District Planning Secretary indicates that 84% of the population is located in layers 1, 2 and 3 while layers 5 and 6 sum up together only 422.000 people. Thus, there is social inequality in the Capital District, which is confirmed when analysing the income per month.

Bogotá traditional and international city centres, 2007 Author: hayder Acosta

Bogotá popular neigbourhoods, 2009
Author Juanita Barriga

Accordingly, there are localities in the city that register monthly incomes per capita of €70 and where 78,3% of the population is under the poverty line. In contrast, there are other localities that register the highest income per capita of the city in a month which is €2700. This figure is three times higher than the mean of Bogotá. This vast inequity is also confirmed when analysing the monthly expenses of the households. Accordingly, the mean of monthly expenses for layers 5 and 6 is €2.400 while in layers 1, 2 and 3 this figure is between €296 and €672 (District Wealth Secretary, 2003)

According to van den Berg. L. et. al (2005) this contrasting tension between "haves" and "have-nots" identified in the case of Bogotá is an actual threat for sustainable urban growth. For instance, it has an impact in the way in which the citizens, specially foreign citizens, perceive urban safety. Actually this is the case of Bogotá, which is one of the most safety cities of Latin-America (Figure 4.13) but the perception of this safety have been hampered by this social inequity and its historic reputation.

Figure 4.12. Socio-economic division of Bogotá by layers. Source: Invest in Bogotá, 2009

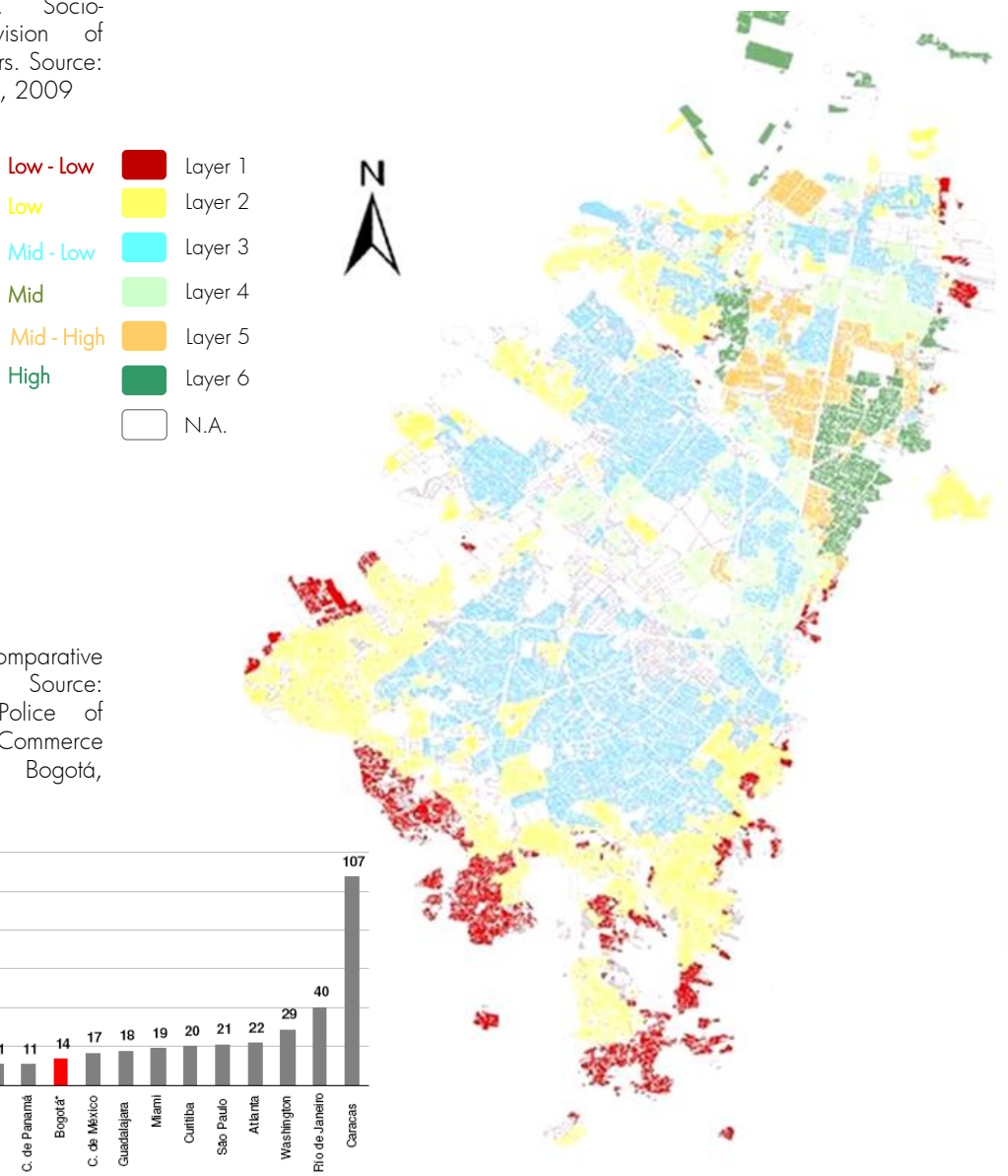
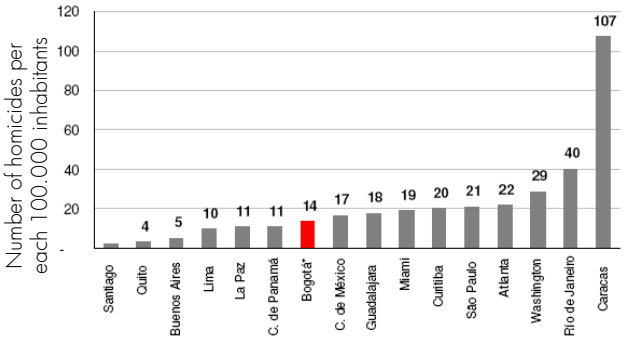


Figure4.13. Comparative safety index. Source: Metropolitan Police of Bogotá and Commerce Chamber of Bogotá, 2008



Knowledge activities of Bogotá

Attracting and retaining knowledge workers

The transformation of Bogotá during the last two decades not only has improved the quality of life of its citizens but has positioned this city as the most attractive city to live in Colombia and one of the best cities to do business in Latin-America [5]. This last statement is supported by the combination of factors such as the diversity and size of the labour market; the strong public – private cooperation; the well connectivity of its location and the strong support of entrepreneurs. Besides the relevance of the labour market, the large supply of cultural and leisure activities; and the diverse and large supply of higher education institutions as well as academic programmes are the main reasons in attracting students and knowledge workers from all regions of the country. Therefore, Bogotá and its region absorbs 45% of the total student population of the country and its HEI´s graduate more than 67.000 professionals and technicians (SINIES, 2007). Thus, 74% of the students graduated in Bogotá enter in the formal labour market. This means that the amount of well-educated people that enter in the labour market every year is approximately 1,2% of the total labour force (SINIES, 2007). Nonetheless, this share has presented a sustained growth in the last five years. Likewise, most of them go into service and productive segments, where the main economic activity is distributed, rather than research activities. In fact, the areas of knowledge with more students enrolled and graduated in HEI´s are Management, Finance and Business; Engineers and Architecture; and Social and Human Sciences (Colombian Labour Observatory of graduated students, 2008). In contrast, the share of students graduated from Arts and Media is relatively low to support the creative industry in Bogotá, which is one of the main segments attracting foreign investment in the country[6].

[5] During 2007-2009 Colombia is positioned as the 6th city to do business in Latin-America. (America Economia Intelligence, 2009)

[6] The Colombian audiovisual production is one of the most dynamic industries in Latin-America. Bogotá, where 80% of the companies in this segment are concentrated, is the main investment destination in Colombia. (Invest in Bogotá, 2010)

Despite the good climate of the cultural and working environments, the qualitative deficit and informality of the housing rental market can be a problem retaining knowledge workers. This issue is stressed by socio–economic inequalities that threats the external perception of the urban quality and safety of the living environment. In fact, this inequality can be perceived in the housing supply per social layers where the difference of the housing quality (specially new supply) between high and low income is very contrasting, leading to social exclusion, divided urban areas and tension between social groups.

As a result, the conditions for young workers (including well-educated people and starters) are more difficult since this situation limits their accommodation options forcing them to decide between the two extremes (high costs and good quality - low costs and bad quality), which is strongly influenced by their success in the labour market. All in all the municipality still working hard to solve these social problems [7], in spite of the urban constraints by promoting the high cultural climate and the quality of the living environment in urban areas. However, collaboration between private and private parties to guarantee the quality of the built environment is need it.

[7] , The main issue of the Development Plan of Bogotá 2008-2012 called *"Bogotá Positiva: para vivir mejor"* is improving the quality of life of all citizens in equal conditions.

Creating knowledge

Bogotá offers a large and diverse knowledge infrastructure by having different types of institutions, academic programmes and research institutions. Therefore, there is potential for creating knowledge that can partly be applied for business purposes. Moreover, Bogotá counts with 12 of the 21 most important universities of the national ranking. Indeed, the two best universities are located in Bogotá; the National University of Colombia, Bogotá headquarters (UNAL-B), ranks first and Los Andes University (UNIANDES) ranks second in this list (Table 4.2). Despite, these universities rank 20 and 32 within the best 200 Latin American Universities (CCHS-CSIC© 2010), which is not a good indicator of their academic quality. Indeed, only seven universities in Latin America are ranked among the best 500 universities of the world and none of them are in Colombia. Therefore, the quality of teaching and researchers; research centres; collaboration with private sectors and industry; and graduated is relatively low compared with international standards.

Table 4.2. List of best universities in Colombia. Source: Bogotá Commerce Chamber, 2006

University	Score
UNAL-B	176
UNIANDES	156
Antioquia University	116
Javeriana University	89
Valle University	57
UIS	28
Rosario University	17
Externado University	15
Norte University	14
EAFIT	13
Pontifiicia Bolivariana	11
La Salle University	8
Jorge Tadeo Lozano	7
La Sabana University	7
El Bosque University	5
ICESI	5
District University	4
Libre University	4
Pedagogic University	4
Santo Tomas	4
Cauca University	4

Note: The cells in red are the universities located in Bogotá.

The National University of Colombia, Bogotá headquarters (UNAL-B) has 11 faculties with a wide variety of disciplines, ranging from Arts, Sciences, Humanities and Social Sciences, Economic Sciences Engineering, Agronomy to Medicine. This university has a large research capacity in the national context. It counts with 6 inter-faculties research institutes conceived within the frame of multi-disciplinary work in the fields of sciences, arts and technology. Besides, the university counts with 33 research centres and institutes from different faculties guiding the development and transference of knowledge in specific areas. Moreover, the university counts with more than 300 research groups which carry out a large number of projects. Likewise, the UNIANDES also offers a broad range of knowledge disciplines. It has 9 Faculties: Administration; Architecture and Design; Arts and Humanities; Science; Social Sciences; Law; Economy; Engineering; and Medicine. Moreover, it has the most important School in Government as well as 2 research institutes specialised in development areas and the promotion of education and research. Similarly, the 79% of the HEI's in Bogotá is conformed by broad universities like these two which undertake education and research in a large range of knowledge areas. Indeed, Management, Finance, System Engineering and Law are the academic programmes more offered by universities and with more students enrolled. Thus, the growth in number of programmes in this areas has resulted in an aroused competitiveness that can be a source of increased academic quality. All in all, this diversity of programmes makes difficult to identify the specialisation and academic strengths of the knowledge infrastructure in Bogotá . Undoubtedly, the specialisation of the economic activity of Bogotá into services and the productive transformation have increased the demands in the profile required by these productive segments. As a result the supply and diversity of specialisation programmes has extended recently, being the distribution of programmes by its academic level as 39% for specialisations and 27% for graduated programmes. (Bogotá, Commerce Chamber, 2007)

In R&D activities, Bogotá concentrates the largest capacity in Science, technology and innovation of the country. It counts with a larger number of research institutes; only 516 are located within its HEI´s which participate in all research networks at national level but 85% of the research institutions located in Bogotá are private corporations and foundations. These positive conditions for research activities in Bogotá has promoted the development of a Science, Technology and Innovation District Policy-2007, by which the Capital District has foreseen the development of strategies to support the creation, transference and diffusion of knowledge between knowledge institutions and corporations. Thus, within the frame of Bogotá Development Plan, there is a formulation of an strategic Science, technology and innovation Plan (CTI Plan), which will guide the actions and allocation of resources in this matter. In fact, as part of the mid-term implementation programmes of the CTI Plan, the District has coordinated events, conferences and week lectures with the aim to strength the social appropriation of knowledge processes, as well as generates spaces through which the citizens can be in touch with the production, appropriation, use and transference of knowledge. Accordingly, just in 2009 during the so-called "Science, Technology and Innovation District Week", 209 activities (among seminaries, workshops, expositions) took place in 19 of the 20 localities of the Bogotá District, with a direct participation of more than 20.000 people.

Certainly, Bogotá has positioned as the city in Colombia with the best supply of professional formation at high academic level, which is favourable for the city competitiveness as well as to consolidate the higher education as an exporting sector of services in the Andes Community and the Caribbean. Therefore, there is potential to develop research activities and programmes in which public and private parties are willing to promote and participate.

Applying knowledge and making new contributions

The level of integration between business community and academic institutions in Bogotá differs for education and research activities. In one hand, the specialisation of the economic activity of Bogotá into services has stimulated the growth of professionals graduated in disciplines related with these specialised segments. For instance, the level of integration in education is low by taking place at level of staff and trainees supply, mostly within the region. On the other hand, the research activity is better integrated with business sectors. According with the Global Competitiveness Report 2009-2010 (World Economic Forum, 2009) Colombia has competitive advantage when measuring its "University-industry collaboration in R&D" index, which ranks 36 among 133 countries (p.119). This index is obtained by measuring the sufficient investment in research and development (R&D) especially by the private sector, the presence of high-quality scientific research institutions, extensive collaboration in research between universities and industry, and the protection of intellectual property.

This good level of integration is the result of a recently recognised potential of research activities in Bogotá and the role of local government supporting the concurrence of private sectors with research institutes. In fact, the District Planning Secretary (SDP) has mid and long term strategies to promote the investment and financing of science and technology projects from large firms in the private sector. According to the City Vision-2019, the main challenges to solve in Bogotá during the next years are the ones related with achieving social equity and a competitive economy supported by ICT. In fact, the solutions for these challenges require strengthening of the city´s organising capacity in order to generate, appropriate, apply and diffuse scientific knowledge, technologic development and innovation. For that purpose, the local government –since the early 90's- has been giving the guidelines concerning scientific and technologic development in line with competitiveness and productivity from a regional approach. It did so, trough concerted instances, such as the Competitive Regional Council (CRC) of Bogotá and Cundinamarca, by which a specific group guides the promotion of Science, technology and innovation in order to create, adapt and use the knowledge according to the production needs of the region. The most important project has been the creation of a "Regional Agenda of science and technology for Bogotá and Cundinamarca", which is a public-private initiative conformed by various stakeholders which represent different sectors at regional, district and national levels, such as research institutions, legal entities and universities. This Agenda is working with the vision of developing a City-region oriented towards a productive and equitable knowledge society.

Furthermore, these initiatives to develop a local network, besides the urban diversity and the quality of the knowledge base provide the conditions for new combinations in Bogotá. In 2008, the level of new firm creation increases in 1.102 respect to 2007, which indicates a growth of 6,5% (DANE, 2008). Thus, the number of new societies increases from 16.912 up to 18.014. In fact, 98% of the new firms constituted were located in Bogotá and municipalities of its metropolitan area. According to an economic report of Bogotá and Cundinamarca region, 95% of these new firms are conformed as "micro-sized enterprise" (17.291 in total); followed by small-sized enterprise (631 in total); medium-sized enterprise (65 in total) and large size enterprise (27 in total) [8]. The distribution of the total capital among these firms is 26%, 11%, 7% and 56% respectively. It is highlighted the increase of new firms operating in service sectors, mainly in commerce and real estate activities. Therefore, this issue is relevant since young firms are dynamic and innovative, and generate jobs; they can be important for large firms as partners in innovation and suppliers (van der Berg et al. 2005). Indeed, this specialisation of the economy into services has been used as source of competitive advantage by strategic public-private alliances focused on attracting activities of high technological content. This is the case of "Invest in Bogotá", which is a public-private initiative between the Municipality of Bogotá an the Commerce Chamber of Bogotá, focused on attracting investment for the city and its region.

[8] The Law 905, August 2004, defined the size of societies in Colombia according to their total assets and number of employees in micro, small, medium and large sized enterprises. Accordingly its categorisation by asset value is: micro-firm (< €66.000), small-firms (€66.000 - €666.000), mid-firms (€666.000 - €4 million), and large firms (> €4 million).

Invest in Bogotá has the mission to attract foreign direct investment (FDI) to the city and its region, with the aim to contribute to its economic development, by diversifying the productive basis with added value activities; generating new employment opportunities; supporting the transference of knowledge and technology, facilitating the integration between local firms and investors. According to economic studies developed by this agency, Bogotá has several potential strategic sectors, including (1) Offshore services such as Call Centres, Business process outsourcing (BPO) and Information Technology (IT); (2) Audiovisual production, whit a large workforce made up of professionals, technicians and qualified technologists in film making and television; (3) Services for the oil and Gas industry; (4) Education services; (5) Aircraft maintenance; (6) Medical device production; (7) Pharmaceuticals; (8) Cosmetics; (9) Agricultural business; and (10) Tourism. Actually the strategic location of Bogotá and the quality of its workforce has permitted the establishment of multinationals and national companies in the city, which mainly provide a variety of back office services including IT, finance and accounting, human resource management, engineering and architecture design.

In this regard, the District Science and Technology policy (2007) has been promoting the transference of technology from multinationals that operate in the city to productive and academic sectors through the development of industrial and social cooperation agreements. Nowadays, over 600 multinationals are established and operating in Bogotá and its region, mainly investing in productive sectors and generating employment in the services segments. Likewise, most of this multinationals operates as BPO's. According to the Economic Commission for Latin-American and the Caribbean (CEPAL), the operations of multinationals operating as BPO in Latin America are diverse and the fact that the region attract external operations and multinationals select Latin-American subsidiaries to carry out their transactions represents a positive aspect since they generate employment. This facts also reveals a lack of trust in local firms, among other reasons due to reputation, scale, technical specialisation or informatics barriers [9] . However, the opportunities to export hiring of services in the region have been utilised by multinationals rather than local institutions because the transference of knowledge is only taking place at the supply of professional level.

[9] CEPAL, Iber-American spaces in the knowledge economy, United Nations, 2005

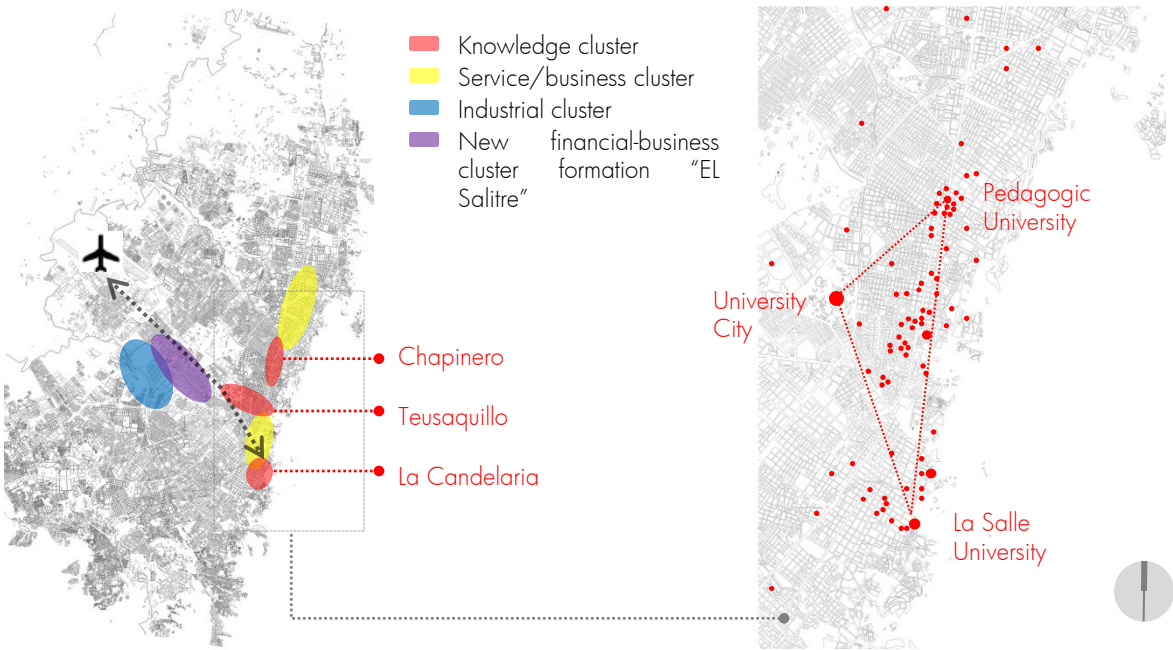
Certainly, the national and local governments have promoted the reflection in this issue but universities have been the ones leading the collaboration with productive sectors. The managers of universities have recognised the dynamics of the higher education context, by understanding that universities has changed in the last 10-15 years and R&D activities are executed with more responsibility and better trained professionals. In this direction and with the support of the research community, some HEI's in different regions on the country have undertake the consolidation of strategies to bring close organisations in order to develop joint projects. Some of these strategies are University - Organisation committees, business matching, workshops and decision rooms.

With the aim to support the competitiveness of Bogotá and its region, the National University of Colombia, Bogotá headquarters, promoted the creation of the University Enterprise Committee (CUE) in 2005 in order to create and support applied research projects focused on solve real technological needs in the country. The intention is looking for interdisciplinary teams formed by researchers of different universities and design and production staff from corporations. Indeed, the positive results of the CUE have attract the participation of the local government, which has committed with corporate productivity and competitiveness. In this sense, it has created an economic fund to support science and technologic projects that promotes innovation.

Developing growth clusters

In Bogotá three physical knowledge cluster can be distinguishes: (1) La Candelaria, located in the historical city centre; (2) Teusaquillo, located in the so-called expanded centre of Bogotá is the largest cluster where more than 30 HEI's are located; and (3) Chapinero towards the north side of the city. The Strategic Plan of Bogotá (POT) has identified the area as a triangle which vertexes are La Salle University in the traditional city centre, the University City in west border of Teusaquillo and the Pedagogic University in the north border of Chapinero. (Figure 4.14). These clusters not only contain the largest portion of the HEI's in Bogotá but the highest labour demand of the service segment in Bogotá where head offices, banks, consultancies and commerce services are located. According to Figure 4.14 two of the three business clusters of the city overlap with the knowledge clusters. Therefore, they are historically bounded with the urban development of Bogotá and the evolution of its productive specialisation, which nowadays is a combination of industrial and service activities where the formation of an new financial and business cluster is highlighted.

Figure 4.14. Geographic knowledge clusters in Bogotá and concentration of HEI's



In the urban context, the HEI-s are located in a geographic centre of the city, in the concentration point of main hierarchical activities such as administrative services, financial services, commerce, tourism, facilities and job demands. Indeed, the strategic location of the University City in Teusaquillo cluster -which creates a tension from East to West direction- appeals to be a functional centre within the city´s planning strategy since articulates the three most important urban elements: (1) the traditional centre where the most representative institutional, cultural, patrimonial, social and educative spaces are concentrated; (2) the Salitre area that nowadays one of the most important economic cluster is forming characterised by its planned nature and its highly dynamic and competitive potential, and (3) the El Dorado airport which constitutes the only international portal of Bogotá and materialises the connectivity of Colombia with the rest of the world. Accordingly, the position of the University City in the Teusaquillo cluster, its character and metropolitan scale play a fundamental role in the development of the city, specially when supporting the vision of Bogotá as a Global City in the context of the knowledge economy.

In this respect, *Bogotá Technopolis* (1998) and *Bogotá: territory of Knowledge* (2006) have been the most influencing initiatives for the Bogotá's Vision 2019 which aim is transforming the city into a science, technology and innovation centre in the Latin American context. This desired image has its legal basis in the before mentioned Science, Technology and Innovation Policy and Plan (2007) and its starting point in the program *Bogotá Global City* which contains specific actions regarding science and technology. This program has been initiated during the city´s administration period 2008-2010, and according to its contents it can be the platform through which the city complete the development process that has made of Bogotá national and international visible. In fact, there are two main issues addressed in *Bogotá: territory of Knowledge:* the development of innovation poles through zoning plans as innovative cities within the city; and conceiving a high quality infrastructure in the context of University-Company-State programmes, public and private research institutes and technologic development.

Therefore, this and more can be achieved if one of the central program of the Development plan 2008-2011, *Global City* is conceived as "*Bogotá Global City 2038"*. This would be a long term vision overcoming the barrier of the administrative periods. Meanwhile, the Districts counts with a regional competitiveness Council with the department of Cundinamarca, which is a public-private partnership that promote strategic projects in infrastructure, development of clusters, innovation, regional cooperation, among others. Indeed, one of the first achievements has emerged from the private sector and is institutionalised as SinerTIC Alliance. This alliance is the result of the union of Colombian corporations in the ICT industry which operates under corporate cooperation and association schemes.

Therefore, this alliance is consolidated as an autonomous cluster that retake the practical experience of business, knowledge, technical capacities, human resource, main advances in R&D and an innovative corporate vision , which is certainly one big step for the development of a knowledge intensive cluster.

Undoubtedly, there is potential to develop knowledge intensive clusters in Bogotá. The presence of many and diverse firms, research institutes and HEI´s in these geographical clusters increases competitiveness and therefore leads to better quality of cluster output. Likewise, the large scale of these clusters and their strategic location in the city ensures a market size large enough to support activities as well as permitting a division of labour and specialisation within the cluster, which according to van den Berg. L. et al. (2005), represents more possibilities for knowledge transfer and more chances to faster penetration of innovation. Besides, the cooperation initiated with the department of Cundinamarca is a positive signal for the economic integration of Bogotá metropolitan area and its region. Moreover, the urban diversity of the Bogotá and its region and the efforts to improve the quality of life bring complementary activities and liveliness that support the cluster structures.

Nonetheless, the level of interaction between the firms and knowledge institutions within the clusters is not strong enough. This is a result of a premature process since, the recognition of this potential is recent and the measures to take advantage of it still in development as well as the overall knowledge economy-society model in the Latin-American context. Over again, this is a result of the unbalanced social environment where social inequality not only threat the quality of life but results in a bad degree of integration within the clusters.

4.1.1.1 Assessment and Conclusions

In order to have an indication of the value of the knowledge economy of Bogotá, the knowledge foundations and activities were assessed according to a measurement scale used in the study *European cities in the knowledge economy* (van den Berg, L. et al. 2005) in this way: Very weak, Weak, Moderate, Good and Very good. In order to make the assessment more clear, this values were ranked in a scale from 1 to 5 respectively. Based in the previous analysis and the references of the mentioned study, the evaluation of Bogotá in the context of the knowledge economy foundations is illustrated in Figure 4.15 as follows:

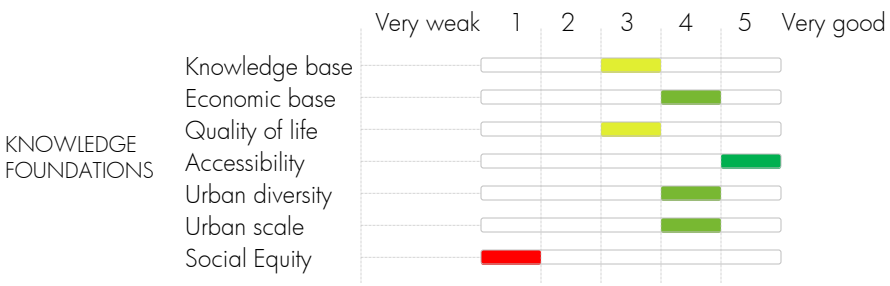


Figure 4.15. Indication of the value of knowledge economy foundations in Bogotá.

According to the previous knowledge foundations assessment, the knowledge activities were evaluated based on activities of the knowledge economy and the necessary "building blocks" model (van den Berg, L. et al. 2005, p.19). Accordingly, a combinations of specific foundations are necessary to develop one or more knowledge activities and they determine the assessment of the knowledge activities as it can be seen in Figure 4.16 below:

Figure 4.16. Indication of the value of knowledge economy activities in Bogotá according to knowledge foundations.

Certainly, Bogotá has favourable conditions for development in the context of the knowledge economy. Being a large city there are scale economies for knowledge activities as well as a larger market for specialised services, which is confirmed by the shift in its productive specialisation into services rather than industrial. Moreover, due to its condition as capital of Colombia, Bogotá has good international transport infrastructure and offers scope for national and international subcultures and all kinds of amenities.

Besides, the cultural life and high levels of diversity of this metropolitan area attract creative workers which prefer inspiring and lively cities rather than smaller places. Likewise, the diversity and size of the knowledge infrastructure of Bogotá attract students from different regions. However, despite the good quality of this institutions in the national context, they are not well positioned in international rankings which is not a good indicator of their academic quality. Therefore, this institutions attract students mainly from other regions within the country. This is also supported by the central and well connected location of the city in Colombia and Latin-America. In fact this strategic location makes of Bogotá very attractive city not only for students but foreign investors and companies in a broad context.

This last issue has an economic implication since more multinationals and ICT companies, interested in this strategic location and the quality of the work force, have established offices in Bogotá generating employment for young professionals in the services sector. Therefore, the concentration of the service activities in Bogotá and their resulting jobs opportunities are the main reason retaining knowledge workers who stay in the city to enter in the labour market. A similar situation happens with R&D activities. Indeed, Bogotá have the higher production of research and innovation in the country but very low compared with the international context. Notwithstanding, the potential of combining research with economic activities has been recognised and many efforts and actions has been taking place from public and private sectors in form of policies, plans and programmes, which nowadays point out to achieve a long term Vision of Bogotá as a knowledge and innovative city, where the formation of a new corporate ICT cluster is highlighted.

➔

It can be concluded that Bogotá has contrasting conditions to become a knowledge city in the context of the knowledge economy. In spite of its good performance applying knowledge and making new combinations, which is supported by public-private initiatives, its average grade creating knowledge is a weak point for the city´s projection in a global context, that positions the students of Bogotá as most of the Latin-American cities as users of knowledge instead creators of knowledge. All in all, the main barrier are the unbalanced social structure of the city as well as the country. The social inequality is a big issue that threats the quality of life, and therefore it become and impediment attracting and retaining knowledge workers in spite of the service specialisation of Bogotá economy. Therefore, in spite of the initiatives and efforts from different actors, the success in developing new growth clusters need a gear of all the foundations which are very contrasted in the case of Bogotá. The moderate grade of this knowledge activity is the scan of the delayed process in adapting a knowledge economy model in Latin America. Thus, it needs more than changes in policy and economic activities. It needs changes in society geared with a common, integral and long term project that guides the path.

4.1.2 Bogotá and European cities in the knowledge economy: comparison and references from practice

According to van den Berg, L. et al (2005) the knowledge economy is a trend that affects every city, but in different ways depending on the specific local situation. Thus, there is no set of policy options that applies to all cities. Instead, cities should carefully analyse their strengths and weakness to define their policies accordingly. Based on this statement the analysis of Bogotá used the framework developed in the study "*European cities in the Knowledge economy*" (van den Berg, L. et al. 2005), in order to measure its performance in a broad context with the end goal to identify the opportunities for universities to play a relevant role in the arenas of the knowledge economy. Nevertheless, positioning the assessment of Bogotá among the nine European cities, which were assessed in the mentioned study, will help to identify similar conditions in different context and learn from the ways in which some of these cities are dealing with their weaknesses as best references in practice.

Knowledge Foundations

The valuation of some knowledge foundations for Bogotá apparently does not differ in great manner with the European cities cases in spite of the large development differences between the countries specially in the context of the knowledge economy. However, the result of the assessment is based on specific local situations measured at national and regional levels without taking in consideration quantitative differences overseas.

As it is illustrated in Figure 4.17 in the opposite page, Bogotá has its major strengths in accessibility, economic base, urban diversity and urban scale. Its condition as capital is favourable since the main economic activity of the country, the international connectivity, the highest and most diverse population and the largest number of amenities are located in its metropolitan area. Therefore, in this foundations Bogotá share positions with different cities at different levels. For instance, cities with very good connectivity and accessibility such as Amsterdam, Rotterdam and Munich rank similar to Bogotá due to their locations near to international airport.

Similarly, their strategic location within a region is valuable. However, while in the European case this geographic connectivity takes place at international level, in Bogotá is more relevant at national level where size and geography matters. Likewise, Bogotá shares positions with Eindhoven, Münster, Dortmund, Amsterdam and Helsinki regarding its economic base, due to their GDP per capita is higher compared to the national average, which is an good indicator of the strength of its economic base in spite of the existent quantitative differences among them [10]. Besides, the case studies most of those cities has a diverse economy dominated by service sectors jobs meanwhile former industrial cities have a weak economic base.

[10] The quantitative differences of GDPs per capita between European cities and Bogotá are enormous. While European cities like Munich, Amsterdam and Helsinki rank between €35.000 to €60.000, Bogotá has a GDP per capita of €7.000. Sources: Office of the UK deputy prime minister 2004, Chamber of Commerce Bogotá, 2007

In the same manner, the urban scale of this cities range as good to succeed in the knowledge economy, although their comparative difference in size. Indeed, the urbanisation process in Colombia is the source of the well-sized urban scale and urban diversity foundations of Bogotá. Therefore, the diversity of foreign inhabitants in Bogotá has a national origin meanwhile cities like Rotterdam, Manchester or Amsterdam, which also scored as good, are more internationally oriented.

Figure 4.17. Positioning the value of knowledge economy foundations in Bogotá with other European cities.

In contrast, the major weakness of Bogotá is its social equity foundation which valuation is very weak and far from European cities. This is the result of socio-political problems in Colombia which strong accent its extremely noticed in its capital, Bogotá. The results of the European case studies shows that social divisions are caused mainly by low levels of education.
Therefore, some lessons can be learnt from cities like Rotterdam and Manchester which perform poorly in the European context and whose local government´s strategies pursuit social inclusion. For example, in Manchester a university institute located in East Manchester is involved in solving the problems by trying to apply their knowledge to improve the neighbourhood.

>> REFERENCE CASE

The use of Universities' knowledge for urban improvements and social integration as well.

Indeed, the poor performance of Social equity foundation in Bogotá is related with the average valuation of its Knowledge base and Quality of life foundations. Firstly, in spite of the diverse and large knowledge infrastructure of Bogotá compared with other Colombian cities, the quality of the education and research varies widely among institutions. Only few HEI's have a strong academic standards at national level but not in the international context. Furthermore, the number of public institutions that maintain the access to education for middle and low socio-economic layers, which represents most of the half of the population, is reduced compared with a large amount of private institutions. Thus, Bogotá ranges lowest compared with European cities which do not deals with so many social problems and the investment for education and research are higher. Secondly, despite all the efforts and achievements in transforming Bogotá in an attractive city, the social division and contrast still being a barrier for its image. According to the comparative assessment of this last foundation, Bogotá shares similar conditions with Rotterdam. For instance, the city of Rotterdam has developed an attractive quality of life in recent years that is accompanied by a rather dynamic, lively city image to diminish the negative impact on city image of large dilapidated neighbourhoods. It does so, through upgrading housing stocks and urban area developments.

>> REFERENCE CASE

Upgrading urban areas through real estate development with the participation of public-private actors lead by a City Image Strategy

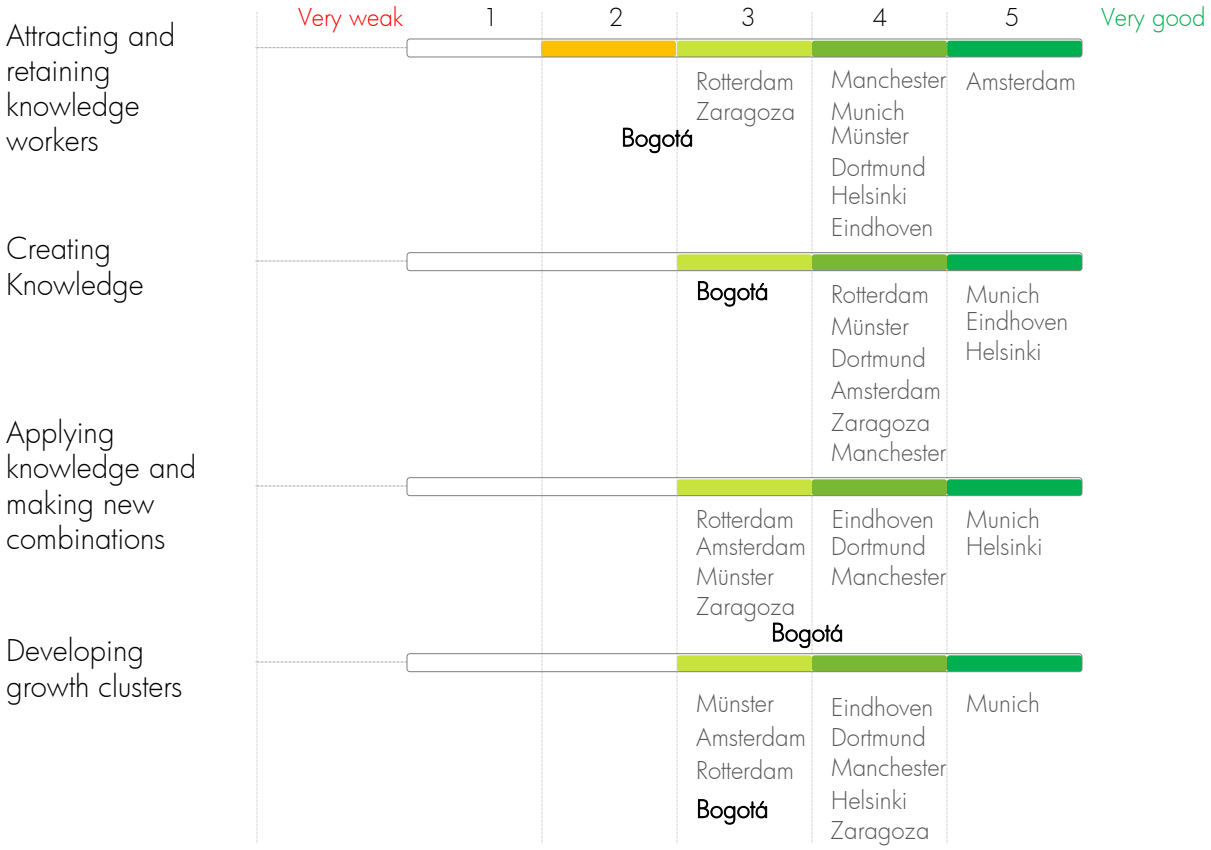
Knowledge Activities

The comparative analysis of the knowledge activities in Bogotá has shown that the city and its different actors are doing efforts to shift from a traditional to a knowledge based economy, but undoubtedly some steps behind the European cases due to the differences in adapting this process, which certainly has taken place in a very different manner in the Latin-American context. Once again this comparative analysis is based on the evaluation of the specific contexts and is not considering the quantitative differences which are not relevant for the purpose of this analysis. As is illustrated in Figure 4.18 Bogotá has a weak performance attracting and retaining knowledge workers and average performance in its remaining knowledge activities. Thus, there is need for improvement the city organising capacity in different levels and with emphasis in specific areas described as follows.

First, despite the advantages of Bogotá as a capital, which allocates many facilities and offer more employment, aspects such as the quality of housing accommodation and the social inequality remains as barriers to attract knowledge workers and keep young talents. In fact, there is a need for upgrading the quality of the housing stock, which will have a positive effect in social and image city arenas. Besides, there is also a need for investment in short stay accommodation for students that hardly exist in a formal market. Actually, the reasons by which some European cities have problems attracting and retaining knowledge workers have a different source more focused in the size of the city and the specialisation of their economic activities, is different to find references in this regard due to city strategy-based differs widely among cities. In spite of the current city vision "*Bogotá Positiva*" is focused on the social component, which is undoubtedly a primary need, more specific actions with the collaboration of other urban actors is need it.

Second, the quality of the knowledge infrastructure of Bogotá (HEI´s, research institutes and high-tech companies) do not have the standard required to create patents that can be transformed into production or new processes. This is a negative indicator for creating new knowledge which positions Bogotá behind the European cities. However, the increasing amount of research institutes and programmes in HEI's, has resulted in a potential to develop research activities in which firms and local government are willing to promote and participate. This potential has been supported by the introduction of new policies promoting science, technology and innovation at national and regional levels.

Figure 4.18. Positioning the value of knowledge economy activities in Bogotá with other European cities.



In contrast, the increasing orientation of the economy of Bogotá into services and other areas but technology is underestimated. Indeed, the identification of strategic sectors in Bogotá such as offshore services; audiovisual production; education services; agricultural business; and tourism can lead to the creation of new knowledge if they receive the joined attention and support from universities, local governments and firms. In fact, some specific actions from the European cases with similar valuation of this knowledge activity can be used as references. For example, Rotterdam has established chairs or professorships in fields that are considered important for the local economy; logistics, ICT, architecture and life sciences through concrete plans promoting as well the cooperation among higher education institutions in this fields.

>> REFERENCE CASE

The Municipality of Rotterdam aims to strength the knowledge creation capacity through the Knowledge economy program PKE (Stuurgroep Kenniseconomie, 2003) by recruiting and founding a top knowledge institution, setting up professorships in specific areas and founding circles with private firms

Third, the identification of this strategic economic sectors and the existence of large number of research groups and institutions in Bogotá has been recognised by governmental authorities who has introduced a new Science, Technology and Innovation policies and initiatives at national, regional and city levels. Therefore, this initiatives contributes positively for applying knowledge and making new combinations since they are aiming to improve cooperation between universities and private sectors. In this regard, as well as some European cases, the national government in Colombia has imposed pressure by declining direct funding for universities and thus giving them a motivation to cooperate with private firms. Nevertheless, this trend already applied in Europe could be a threat in developing regions where business and universities are diverse but not strong enough to collaborate without governmental support. Therefore, the incentive structures from government needs to change. One example is modifying policies and research funds in order to attract financial means from industry.

>> REFERENCE CASE

The polytechnic school in Münster obtains more structural funding when successfully attracting financial means from industry. Likewise, the project Stimulus in Eindhoven provides financial rewards for cooperation between HEI's and business. +info: www.stimulus.nl

Furthermore, cities may co-invest in joint facilities by providing financial rewards for cooperation. To mention one example, CeNTech in Münster is a centre for nanotechnology research, which provides high-levels facilities to university research groups, and encourage the creation of new business out of that research. This point provides the relevance of the quality of research facilities, which could be either provided by universities within its campuses for the joined use and investment of other institutes.

>> REFERENCE CASE

The Center for Nanotechnology (CeNTech) in Münster offers 2.400 m2 space for laboratories and offices, both for research groups and start-up companies. +info: www.centech.de

Other actions come from the city and are related with the location of specific projects close to universities in order to involve them in the design and development of large urban projects. For example, in Zaragoza "Digital Mile" is a basic project of the City Council to help companies, institutions and citizens position themselves to form part of the economic and social means of the 21st century. The proposal includes a City of Innovation and Knowledge, where housing, companies and facilities will exist together under a common orientation fully engaged in knowledge-intensive activities, an urban development of great quality and advanced telecommunications infrastructures which residents and the businesses located in the Mile will benefit from.

>> REFERENCE CASE

Conceptual diagrams of the Campus Digital Mile, its structure and its functions. +info: www.milladigital.org

Altogether, universities and higher education institutions cannot sit back and wait for cities develop strategies in a traditional way and from traditional actors. Instead they should be proactive for example, by taking a lead positions in some initiatives. In this regard, set up of transfer agencies can be used as the best references. In most of the of the European case studies, higher education institutes have transfer agencies which create links with business. Indeed, these agencies are popular in USA also known as "star-up centres" which operates within universities as intellectual property managers. Other way for universities contribute in applying knowledge and making new combinations is to enable firms to use university facilities. For instance, the case of the Technical University in Munich is a good reference since young firms are allowed to use laboratories. This kind of actions also leads to strength the collaboration among universities and large firms which are interested in sponsor research through investment in campus facilities.

REFERENCE CASE <<

Reference 8: The BMW Group and the Technische Universität München are expanding their longstanding cooperation with a new building on the campus in Garching. BMW will erect a new building for the TUM Institute for Advanced Study. +info: http://portal.mytum.de

Finally, the average valuation of the previous three knowledge activities in Bogotá results in an average position of this city in Developing growth clusters. As is illustrated previously in Figure x. Bogotá share positions which the European cities of Münster, Amsterdam and Rotterdam. Certainly, it does it means that their conditions are the same, but at least the combinations of specific factors in each case has leads to similar results. Therefore, their actions can be used as references for the case of Bogotá.

Bogotá as well as many cities overseas is trying to add a "knowledge component" to traditional economic sectors. Thus, the selection of target clusters should be based on existing and distinctive strengths of the city. For instance, ICT, Sciences and Biotechnology are popular on receiving special policy attention from the local government in most of the cities including Bogotá. However, Bogotá and its metropolitan area has other potential activities, which were mentioned before, that are growing up in the local economy and therefore should be specific targets of policies for cluster formations. In this respect there is an intention to develop a financial and business cluster in an area well known as "Innovation ring" were large firms, financial services, commerce, educational and other complementary services are located and well connected with the international airport and other regional and local transportation hubs. This strong market potential in financial and business services, has strongly dominated corporate location decisions and the development of the sector. Thus, in this context, higher education institutions should assume their active role in the development of potential clusters and their respective strengths. For that purpose, targeted actions are needed aimed to join stakeholders interests from HEI´s, local or national government and private firms towards a comprehensive policy for cluster creation.

Therefore, Rotterdam is a good example of how cluster policy can be organised. This city has established an Economic Development Board whose members are high-level local actors from the private, semi-private and public sectors. Each member is responsible for one target cluster and develops the policy with all stakeholders involved (van den Berg, L. et al. 2005, p. 354)

REFERENCE CASE <<

The Economic Development Board Rotterdam (EDBR) advises the city council on economic projects and on the enhancement of international orientation by the trade and industry branch in Rotterdam. The EDBR consists of approximately 30 entrepreneurs distinctive to the Rotterdam trade and industry, representatives of local knowledge institutions and Directors of the Rotterdam Development Corporation and the Port of Rotterdam. The following spearhead cluster are highlighted:
-ICT
-Audio visual
-Health and medical tech.
-Transports & logistics
-Architecture
-R&D zone Rotterdam-Delft

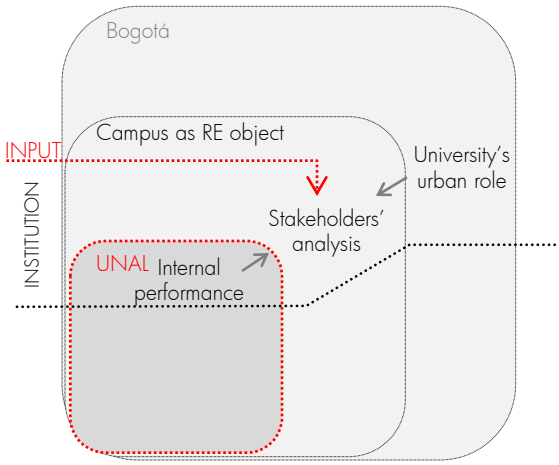
+info: www.edbr.nl

Conclusions comparative analysis

In the case of Bogotá, it can be concluded that its knowledge foundations are rather weak to moderate, the prospects for the city look promising. In spite of the their lagged position compared with the European cities case studies, Bogotá has started initiatives to enhance and extend knowledge-driven activities in a form of policies and plans. However, there is a need for implementation of this activities that requires a high degree of organising capacity. According to van den Berg, Braun and van den Meer (1997), *organising capacity* refers to the entire process from the identification of certain needs, through the development of strategies and policy, to the implementation of the policy and the monitoring of the results. In this sense, the organising capacity of the Bogotá in the context of the knowledge economy is half-way in this process. The city has identified its needs and has developed policies and strategies in order to adapt a knowledge-based economic model, but the implementation of specific activities has just started. Therefore, there is a need to improve the quality of its knowledge foundations to remain successful in the knowledge economy. In general terms, this need constitutes the main barrier to successfully develop knowledge activities.

Therefore, city policy makers in Bogotá should generate mechanisms that lead to the improvement of three priority foundations that are threatening the development of a knowledge economy; Social equity, Quality of life and Knowledge base. Besides, policy makers and planners should be aware of the potential of the remaining knowledge foundations; Economic base, Urban diversity, Urban Scale and Accessibility as advantage for the development of knowledge-intensive activities. For instance, this analysis has demonstrated that universities as well as other and research institutes play an important role in the implementation of this knowledge-intensive activities. Therefore, the set of city policies, programmes and plans should be interpreted by campus managers and planners as opportunities to evaluate their visions and lead some initiatives in line with their institutional goals and plans. In fact, the references presented in this comparative analysis can be used as inspiration for other collaboration models more suitable for the context of Bogotá.
All in all, this analysis not only permitted to positioned the universities of Bogotá in the context of the knowledge economy of Colombia but has permitted to identify strategic stakeholders at broad city levels which could play a role as strategic partners for campus development. The list of the stakeholders and their involvement in campus management for the University City case will be analysed in the next part of this chapter.

4.2 The University City and its institutional vision



Moises Vasserman, Current Rector UNAL,. Author: Unimedios, 2010

4.2.1 Stakeholder's analysis

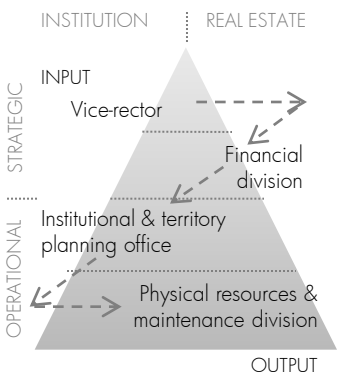
Real estate decision-making process in institutions involves multiple internal-external stakeholders which interest on campus range from internal demands -such as users and policy makers- to external attitudes such as the society as a whole. The following analysis is aimed to identify the different actors and its diverse interest, who have a direct or indirect influence in the management of the campus in the case of the University City. For that purpose the analysis is based on a basic framework for campus management, connecting four stakeholders' variables (Heijer, A. den, 2006). Likewise, in order to make the analysis comprehensive, direct and indirect influences were addressed separately by dividing the analysis into internal and external stakeholders respectively.

4.2.1.1 Internal Stakeholders 'analysis

According to Figure 4.19 in the opposite page, and due to the nature of the University City as national and public university there are many stakeholders involved in campus management. However the influence their values have regarding campus decisions is different for all of them. In this sense, three levels of stakeholders can be identified from the core of campus management. The first level, which is illustrated in dark grey, positions the individuals or group of individuals (external at national level and internal at headquarters level) that defines different values for campus management. For instance, in the University City the *institutional* and *functional* values in the demand side are defined first, by the higher education policy makers at national and headquarters levels and second, by the university community which involves all internal and external users. In the other hand, the *financial* and *technical* values in the supply side are defined internally by the same stakeholder who is the management director of the headquarters. However, his value is also influenced by other external actors at national and district level adding distinct financial and technical values.

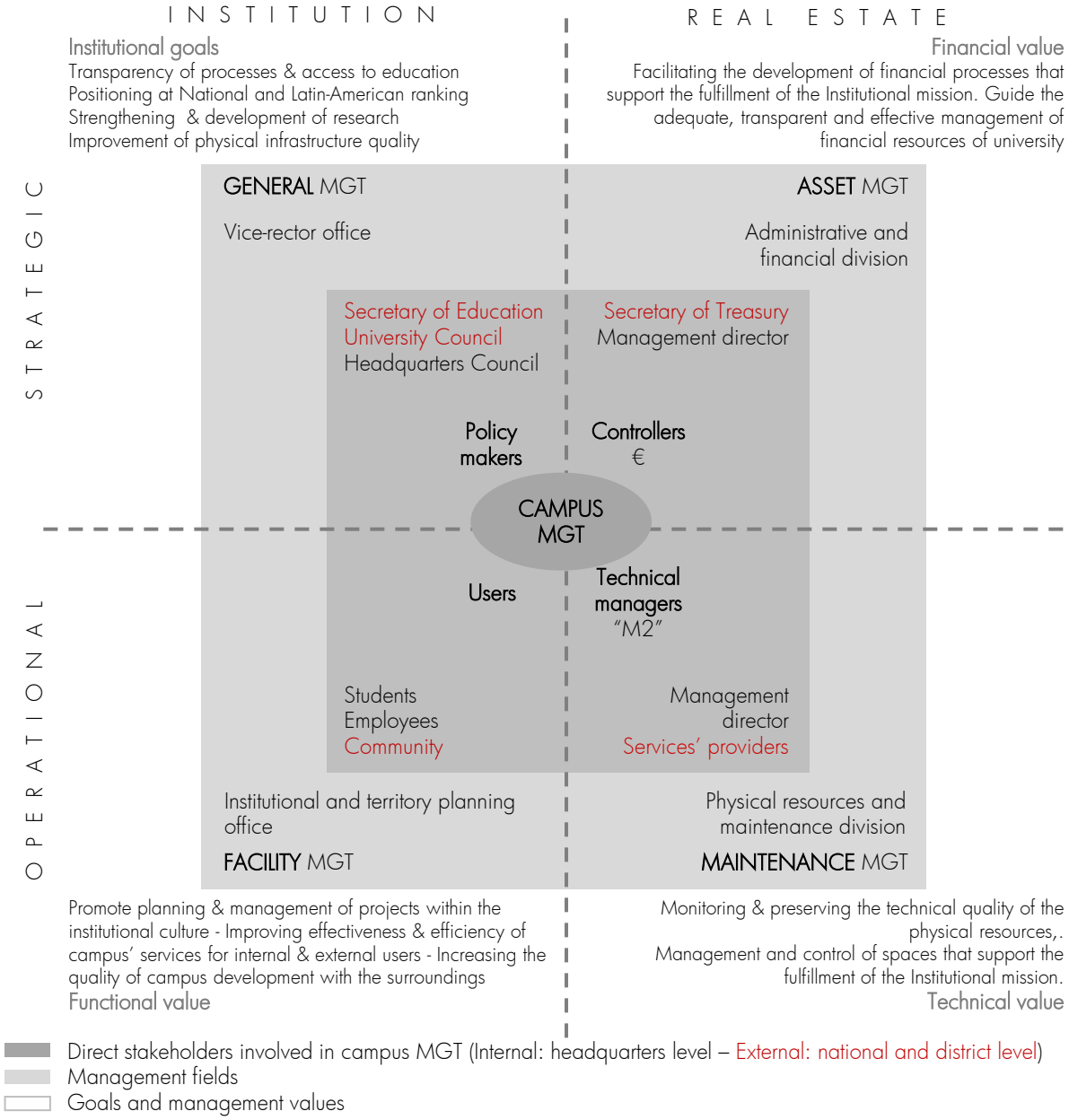
The second level of stakeholders, which is illustrated in light grey, involves the offices or divisions that support and represent these individual values. For instance, these legal bodies are directly concerned with taking campus decisions at headquarters level and they constitute the four management fields related with campus management: General MGT, Asset MGT, Facility MGT and Maintenance MGT. Finally, the third level, which is illustrated in white, translates the mentioned individual values into specific missions or tasks carried out by these legal bodies. Indeed, through this third level of the stakeholders ´analysis one can identify the hierarchy of values within the campus management process. In most of the cases, the higher institutional goals are the main source of input for the management process. In the case of the University City, among others broad educational goals, the improvement of physical resources appears as one of the highlights stated in the institutional document "UNAL Vision 2017".

Figure 4.20 Hierarchy of stakeholders' values and the legal bodies they represent in the University City, Bogotá.



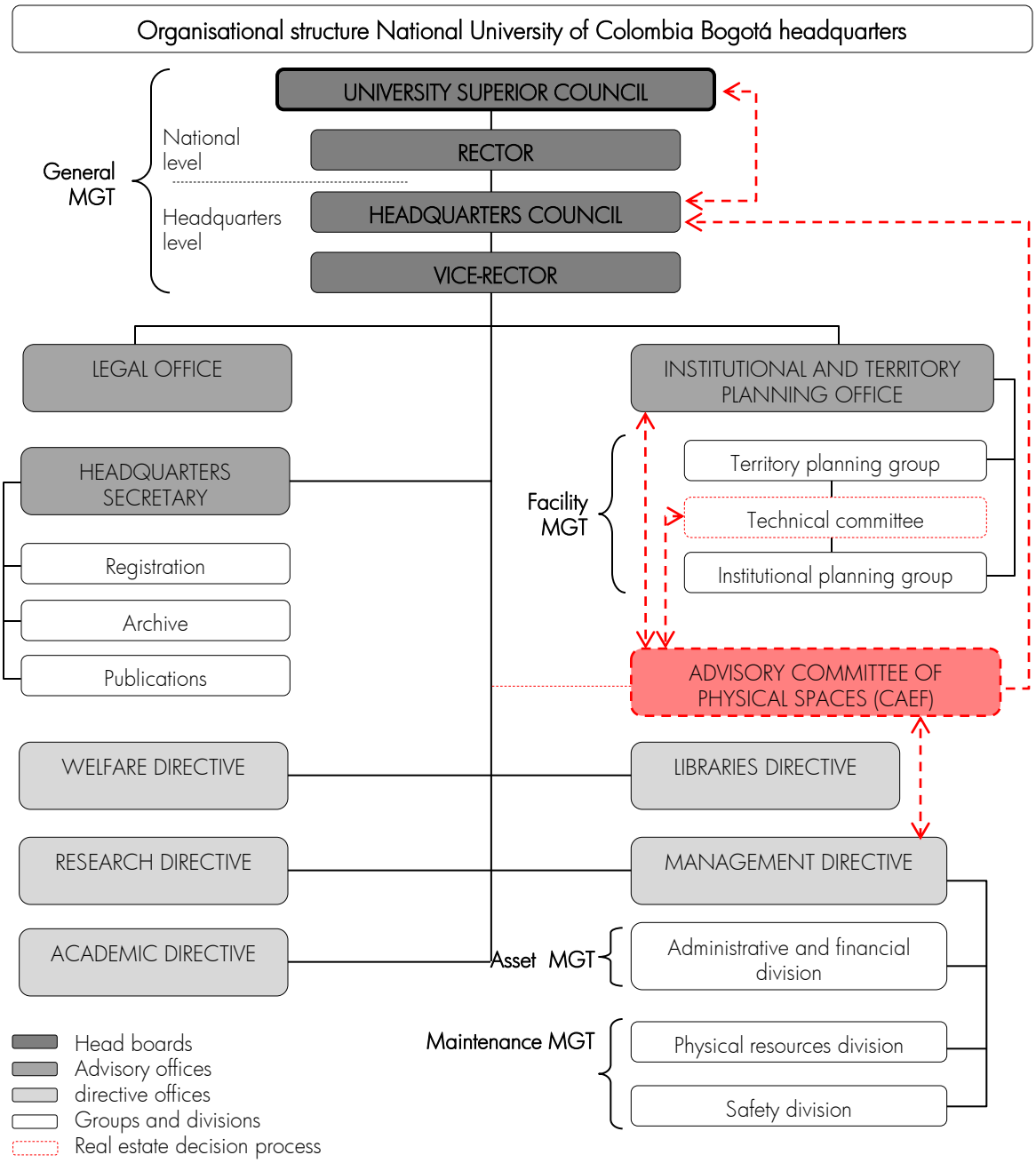
For instance, this institutional vision, which involves real estate as a mean to reach institutional goals lead by the Vice-rector, is supported by two advisory offices. First, the Administrative and Financial division which facilitates the development of financial processes supporting the fulfillment of the institutional mission. Second, the Institutional & Territory Planning office which orientates the development of the campus in order to support the academic function according to national and local policies. Indeed, this office supports both the institutional and the financial mission of the university by improving the results, effects and positive impacts of the campus' investments. Finally, the Physical Resources & Maintenance division is positioned at the end of the campus management chain. Its main task is monitoring and preserving the technical quality of the physical resources according to guidelines given by the institutional and territory planning office, becoming the output of the process. (Figure 4.20)

Figure 4.19. Internal stakeholders' analysis of the University City based on model by Heijer, den (2006) Source: UNAL Vision 2017, UNAL Development Plan 2010 – 2012, Interviews with Vice-Rector and planning office director of University City, Bogotá



In order to identify the effectiveness of the campus management, it is imperative to position of this stakeholders within organisational structure of the UCB and their roles in campus real estate decisions. According to Figure 4.21, three hierarchies and competences can be identified:
•Hierarchy 1: Head boards (divided at national and headquarters level)
•Hierarchy 2: Head Advisory offices (supporting the board of the headquarters) and directive offices (specialised management branches supporting the board of the headquarters)
•Hierarchy 3: Division and groups (specialised departments supporting directive offices)

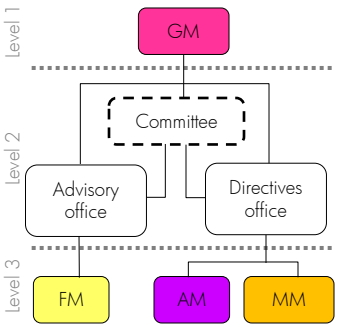
Figure 4.21. Identification of stakeholders according to organisational structure of the University City of Bogotá, Source: Institutional administrative structure, Bogotá headquarters, available at www.unal.edu.co, Interview with Institutional & Territory Planning office director: Nelson Lugo.



This hierarchical division in many specialisation of functions responds to an administrative model driven by a bureaucratic character existent in many public institutions where power is delegated in order to avoid corruption and increase transparency in the decision making process. In the case of the University City of Bogotá, this hierarchical division of power is lineal since the relationship between superiors and subordinates is direct. For instance, there is central communication line between the head boards of the university and their supporting offices and departments. In the same manner these offices and departments delegate functions to other specialised divisions in one communication line.

According to these relationships, it can be said that the organisational structure of the UCB is centralised. Therefore, the role of the General Management field, which is located in the top of the organisational structure, is crucial since it acts as main authority among different departments on the same hierarchical level. Indeed, the other three management fields identified in the stakeholders' analysis (Facility MGT, Asset MGT and Maintenance MGT) are specialised divisions which belongs to the third hierarchical level and have a direct relationship with their superiors which are more generic advisory offices or directives located in the second hierarchical level. For instance, the campus (real estate) decision making process involving these four management fields, which is illustrated in red line in Figure 4.21, takes place at all three hierarchical levels within the organisational structure. However, an intermediate advisory committee at the second hierarchical level appears as functional connector between two areas of specialisation at the same hierarchical level and the head boards at first hierarchical level.

Figure 4.22. Positioning the four campus management fields (General GM, Asset AM, Facility FM and Maintenance MM) according to hierarchical levels identified within the organisational structure of University City



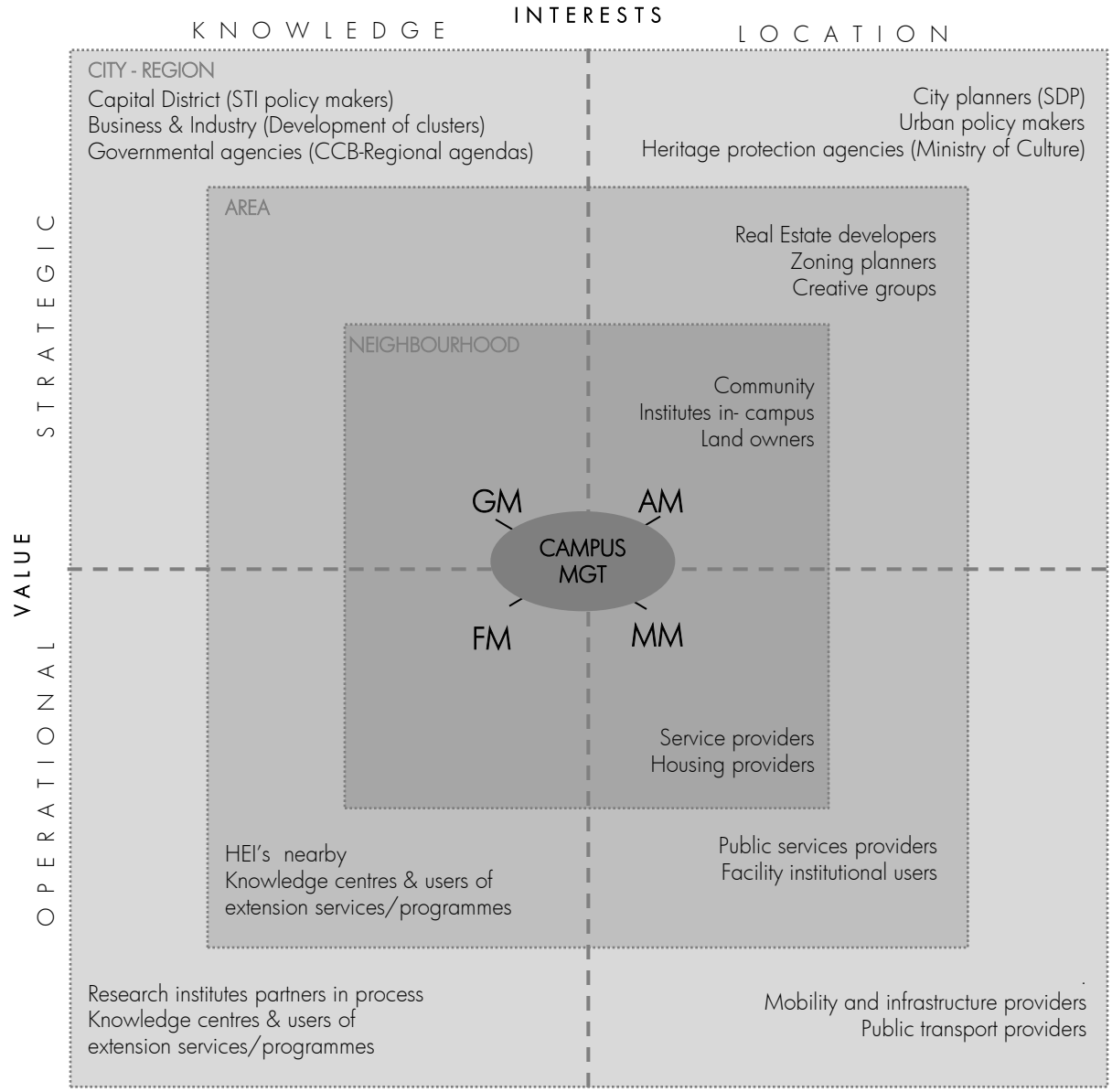
Therefore, having the four campus management fields at different hierarchical levels can be a limitation for strategies' implementation. However this advisory committee appears as communication channel between the four management fields by balancing the organisational units involved in campus real estate decisions (see Figure 4.22).

4.2.1.2 External Stakeholders 'analysis

The following analysis uses a complementary framework developed during previous literature review, in order to identify external stakeholders at city, area and neighbourhood level who has an indirect influence in the management of the campus. For instance, by identifying these urban actors and their interest on campus, the university will have the opportunity to identify strategic alliances or partners to share goals and resources with and therefore optimise the management of the campus. As it is illustrated in Figure 4.23, there is a clear division of urban stakeholders in two groups according to their interest on the University City. The first group correspond to the stakeholders interested in the quality of the knowledge base of this institution (academic programmes, research activities and provision of knowledge workers). Meanwhile the second group is interested on the quality of its location in terms of connectivity with city structures, supply of urban facilities and concentration of a large community.

Likewise, the shift of campus management from operational to strategic level is also visible in the kind of relationship between this external stakeholders and the university. While some actors share a functional relationship with the institutions by providing (to) or receiving specific services from the universities, some others are focused in wider strategic goals such as promoting local socio-economic growth or developing wide city visions where the university plays a vital role. Indeed, this relationship in values of stakeholders' interests is crucial to identify the shared goals between the internal and external stakeholders, which can be used as source to orientate some strategies in each different campus management field. In the same manner this combined framework differentiates the urban stakeholders according to their scale of influence and perceived impact on campus management. Accordingly, three levels are distinguished: city, area and neighbourhood. In this way, campus managers will be able to define the prior alliances and partners according with the scale level of their specific projects on campus.

Figure 4.23. Identification of external stakeholders according to their level of urban impact



➔

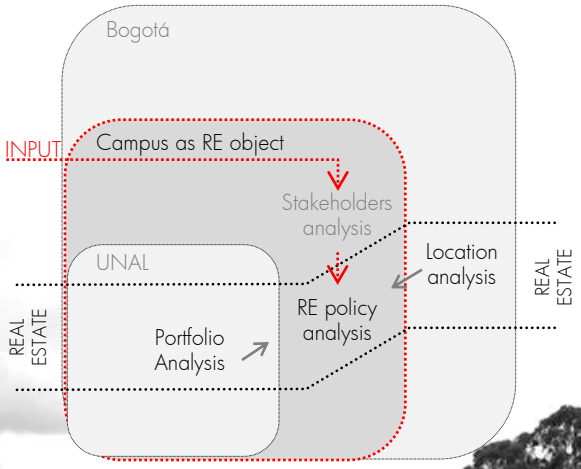
According to the previous scheme, it can be concluded that the interests of the urban stakeholders on the University City's *location* is more perceived than the interest on its *knowledge* base, due to the presence of urban stakeholders at overall levels: city, area and neighbourhood. Although, both qualitative aspects –knowledge and location- are relevant influencing internal campus management at strategic and operational levels.

At strategic level, one can notice that the Internal General Management is influenced at wide city level through regional developmental and economic policies involving public and private sectors. For instance, the institutional goals contained in "UNAL- Vision 2017" which are aimed to improve the quality of its knowledge base by strengthening the development of research activities are aligned with higher city-regional policies and programmes, which are mentioned previously in the context analysis, aimed to strength and develop a knowledge-based economy. Thus, this shared goal is presented as a great opportunity for the UNAL to look for public and private partners which could be willing to collaborate with the institution in the knowledge exchange process expected for future economic developments. Likewise, the internal Asset Management, which goal is facilitating the financial development of processes that support the fulfilment of the Institutional mission, should pay more attention to the value of the UC's location and the roles the university can play in its urban context in order to optimise the allocation of financial resources. First, as holder of a large piece of land in the most important functional area of the city. Second, as urban developer at neighbourhood and area level due to the level of engagement with their surroundings. However, participate in real estate developments is a complex task, in which the UNAL has never been engaged, since the university needs to still maintaining both physically and programmatically the autonomy required for the production of knowledge. Finally, as owner and managers of one of the most he significant and symbolic property (land and real estate) of the city which cultural value could be target of investment for other governmental bodies [11].

[11] The presence of 17 buildings declared National Monument and 11 buildings of cultural interest has positioned the entire campus as "Heritage group" according to the Ministry of Culture. Source: PRM, 2005

At operational level, the internal Facility and Maintenance Management fields of the campus are influenced at overall neighbourhood, area and city levels. It does so, through suppliers and demanders of their academic and professional functions. In fact, campus facility managers should seen the demand side as an opportunity to share campus facilities with other partners in process and introduce this external demands within campus planning in order to provide an effective and efficient service for internal and external users as well as to increase the quality of campus development with the surroundings. In this last regard, the campus maintenance managers needs to design monitoring strategies to preserve the technical conditions of the buildings in order to support university functions and orientate specific actions towards buildings that allocate important functions.

4.3 The University City and its real estate supply



Central square University City Bogotá, 2007. Author: Juanita Barriga

4.3.1 Portfolio analysis

Description

The National University of Colombia (UNAL) is owner of an extend portfolio distributed in the metropolitan area of Bogotá. Besides the University City which is the target of this study, the UNAL counts with more than 100 hectares of land distributed in urban (89.317m2) and rural (962.302m2) land and 38 buildings which altogether sum up a total GFA of 77.984m2, from which 72.266m2 are located in urban land. Most of these buildings allocates administrative, extension services and facilities. Only few of them, specifically located in the satellite campus of "Marengo" (rural area) allocate academic functions. Among others, two heritage buildings in the traditional city centre and one Hospital are highlighted.

[12] Data obtained through portfolio analysis. See Apendix x. Source: Garcia, B., Real Estate Valuation of the University City, 2007

The University City campus occupies an area of 1'207.657m2 and is composed by 131 buildings on total; 81 of them are fulfilling the main university's functions (academic, research and administrative uses); 7 buildings are occupied by other institutions in the legal form of Commodatum; and the other 43 are supporting the main functions (services and infrastructure). Altogether sum up a total GFA of 333.301m2, distributed as follows: 61% for academic use (205.042m2); 24% for administrative activities (83.157m2); 12% for the use of other institutions (40.725m2); and 3% for services and infrastructure (4.377m2)[12] . The overall portfolio is illustrated in Figure 4.24 in the opposite page.

Auditorium Leon de Greiff

Sport centre

As a "Greenfield" typology, the campus has an floor space index (FSI) of 0.27 which indicates that the total floor area of the buildings is only 27% of the gross floor area of the plot. Therefore, the presence of green areas in the campus has been characteristic and relevant for campus development ever since. The average size of buildings is 2500m2 and the growth of the portfolio has taken place in an incremental way. In fact, for more than 50 years the supply of spaces and buildings happened according to emergent academic and operational needs without planning. This period correspond to the years after the completion of the1st phase of the University City 1939-1944, well known as the "white city" which follows the original plan developed by the architect Leopold Rother and the formulation of the Regularisation and Management Plan in 2005 as an urban requirement for university expansion and impacts in the surroundings.

Student Centre Faculty of Engineering

The current portfolio of the UCB is diverse; it counts not only with buildings for academic and administrative purposes to accommodate eleven faculties, twelve centres and twelve institutes but cultural and sport facilities for the use of the students and citizens communities such as museums, concert halls, church and a large sport area with multiple fields and a stadium, which could be used as physical resources to attract students and external users. Besides, the campus count with a large amount of public space an green areas for the enjoyment of the university community and citizens in general.

Figure 4.24. Portfolio owned by the UNAL in the metropolitan area of Bogotá

- Urban land
- Rural land

La Esperanza Plot
12.000m2 land

Santa Rosa Hospital
5 buildings

Marengo campus
9 buildings – 96 ha.

University City
131 buildings – 120 ha.

Las Nieves
1 building

Administrative Unit "Uriel Gutierrez & Camilo Torres"
5 buildings

6pth street house
1 building

Gaitan centre - museum
12 buildings

Radio broadcast station - 1 building

San Agustin Monastery
1 building

National observatory
1 building

Parameters for analysis and accommodation needs

The information presented here is limited to the University City which is the target of this research. Nonetheless, the analysis of the portfolio (Appendix IV) included the overall property owned by the university since accommodation decisions for the University City campus as real estate object are related with the entire portfolio of one single institution. Therefore, since corporate real estate is seen as a source to contribute to organisation's goals, this last should be the basis to measure the portfolio in relation with university vision and needs.

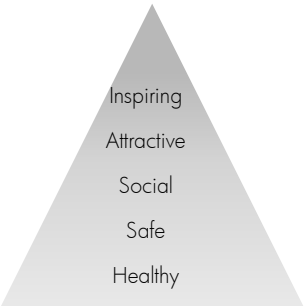
Accordingly, the "UNAL-Vision, 2017",which higher goal is positioning itself as 1st and 3rd at National and Latin-American rankings respectively, is focused on strengthening research activities and improving the quality of its physical infrastructure. Furthermore, according to interview with the current Vice-Rector of the UNAL-Bogotá headquarters, the most important aspects highlighted in this administrative period are: Transparency; Strengthening of postgraduate programmes; Improvement of physical infrastructure by providing better quality standards; and Modernization of physical space in order to change users attitudes and strength sense of belonging.

In this context and according to De Vries (2004) the added value of university City's real estate is aimed to increase "*distinctiveness*" and "*productivity*" as priorities to fulfil the institutional accommodation needs and desires. Indeed, the relevant character of the National University of Colombia as public institution and its symbolic value for the society are therefore, key aspects in the definition of parameters for portfolio analysis. Certainly, both institutional goals (distinctiveness and productivity) are strongly related with the quality of the spaces supporting university's functions. In this regard, the translation of Maslow's hierarchy of needs into quality levels in learning and working environments (Den Heijer, A. 2007) are used to define the parameters and the priority of values for analysis (Figure 4.25). In fact, this hierarchy of needs can be associated with specific universities' intended objectives identified in the study "Universiteitsvastgoed in Nederland" (Den Heijer, A., 2007). As is illustrated as follows, the priority given to these intended objectives which are common for many higher education institutions in different contexts, defines a management orientation and can be used to prioritise campus real estate decisions as well. Based in the current UNAL vision, its accommodation needs and the public character of the institution, the identification of prior university's goals in the case of the University City which must be supported by managers real estate decisions are highlighted in the box of the opposite page.

Accordingly, the management of the UCB campus must support these specific goals which were translated into 11 parameters for analysis divided in four values: symbolic, economic, technical and functional (Figure 4.26). Indeed, for integral real estate decisions, attention should be paid to all parameters. Nonetheless, in the case of the UCB, priority should be given to symbolic and functional value which are crucial to align real estate supply with institutional vision.

"We are working hard to recovery the image and position of the university in the 30's which deserves the title of the "White City". In that time the campus was the most important space dedicated exclusively for intellectual activities and icon of the most representative buildings of the modern style in Colombia. We want to retake the idea of making emblematic architectonic spaces for education and this is a vision that involves the society as a whole since the "University City" is part of a collective memory and has a symbolic value not only in Bogotá but in the whole country"

Figure 4.25. Translated Maslow's hierarchy of needs for learning and working environments. Source: den Heijer, A., Universiteitsvastgoed in Nederland, 2007



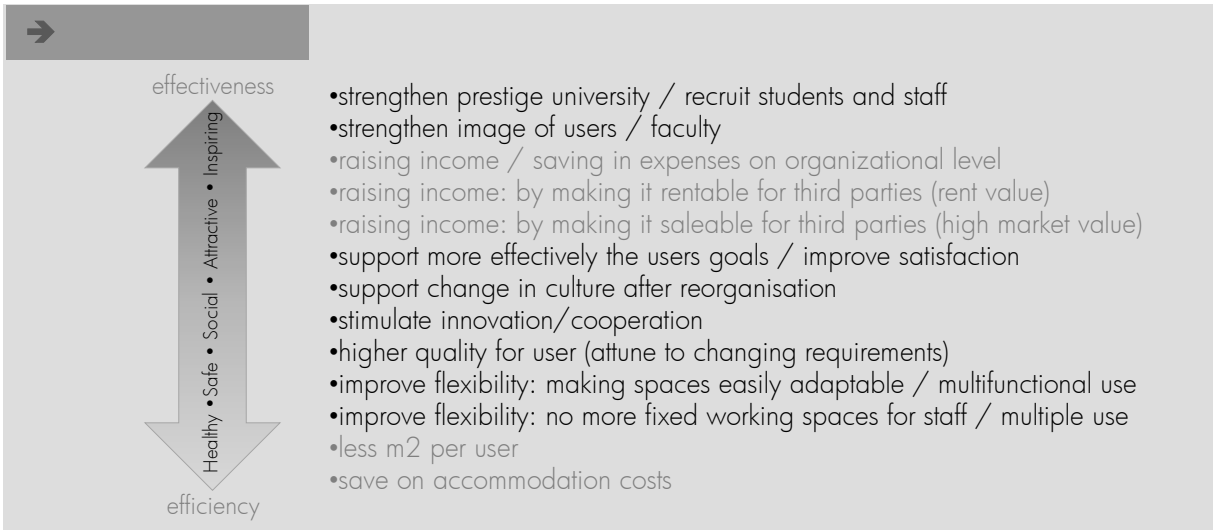


Figure 4.26. Parameters to measure the value of UNAL's portfolio in the UCB.

Lead to EFFECTIVENESS

Cultural Function

	Very poor 1	Poor 2	Moderate 3	Good 4	Very good 5
SYMBOLIC VALUE					
Perceived University image & prestige	Very poor architecture	Poor architecture	Non-relevant architecture	Representative architecture	Landmarks & Heritage
Building Use relevance	Services T-III (Infrastructure allocation)	Services T-II (Internal Operation)	Services T-I (support function)	Welfare services, Facilities	Academic & Research, Administrative
Location - Accessibility	Only by car	>30 min by public transport	20 – 30 min by public transport	10 – 20 min by public transport	<10min by public transport
Location –Urban Integration	Rural area		Urban area		Within urban centrality
ECONOMIC VALUE					
Valuation (value in use)	< €100/m2	€100 - 200/m2	€200 - 400/m2	€400 - 600/m2	> €600/m2
Operation & maintenance costs per m2		No data available			
TECHNICAL VALUE					
Conservation status	No value for investment	Need several repairs	Need simple repairs	Not relevant damages	New buildings
Energy consumption		No data available			
FUNCTIONAL VALUE					
Flexibility – Efficiency of floor plans	Supporting walls	Combined structure	Column grid <4,8	Column grid =4,8m	Column grid >4,8m
Availability of sharing academic spaces	No lecture rooms	1 Lecture room 50-100 places	1 Lecture room >100 places	+1 Lecture room 50-100 places	+1 Lecture room >100 places
Workplace innovation		No data available			

Utility Function

Leads to EFFICIENCY

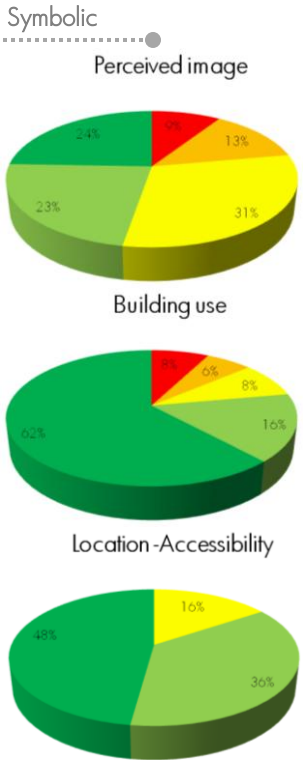
Synthesis portfolio analysis and conclusions

The valuation of the portfolio of the University City has permitted to identify the opportunities and limitations of the physical infrastructure supporting the university accommodation needs and vision. Thus, real estate decision should be based on an integrated criteria involving all values. The synthesis of the data gathered in the Appendix IV is described by their value in as follows:

Figure4.27. Consolidated valuation of the UC's. Source: Appendix IV

Symbolic value

As can be seen in Figure 4.27 almost the half of the portfolio, 47% of the total number of buildings in the UCB, has a positive perceived image for internal and external users. Accordingly, 24% are urban landmarks or either declared heritage buildings at national level and 23% of the buildings are representative of and architectonic period. Nonetheless, 31% of the portfolio has a non-relevant architectonic value while 22% has a perceived poor and negative image that certainly threats university's prestige and distinctiveness as prior institutional goals. According to the total building use distribution, 62% of the buildings are functionally relevant since they accommodate the main university's function such as academic, research and administrative activities; 16% are facilities and welfare services for the enjoyment of the university community; 8% are services type I supporting the main functions linked to community use; and the remaining 14% are services type II and III which allocates internal operative services or infrastructure not linked to users. Thus, campus managers must classify as primary targets for functional value the buildings which scored 5, 4, 3 since they are in direct contact with university's users aimed to increase productivity for learning and working environments as one of the institutional goals. Furthermore, the location & accessibility parameter has shown a high connectivity of the portfolio. The valuation of this parameter excluded the Services type II and III as buildings uses which accessibility is not relevant for university's users. Accordingly, 48% of this functional buildings can be accessed in less than 10 minutes from the main public transport systems; 36% of them in less than 20 minutes; and 16% between 20-30 minutes, which is the maximum walking distance between buildings inside the campus. This positive valuation is the result of the strategic location of the UCB which will be analysed in the next part of this report. Like wise, the entire portfolio of the UCB is scored with 5 due to its centric location in the city has exceptional conditions for urban integration.



Economic value

Since the property inside the University City campus is not marketable, the economic value of the portfolio was measured by using available data based on the "replacement costs method" to re-establish the value of the building as a new one by applying the depreciation per use, conservations status and function. Accordingly, the assessment was made by establishing a range from 1 to 5 with the existing values which range from €60 up to €1300 per square meter Actually this range differs in great manner according to the use of the buildings.

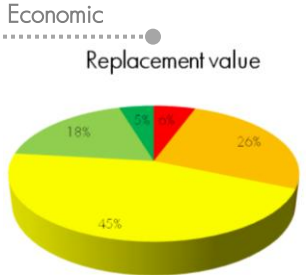
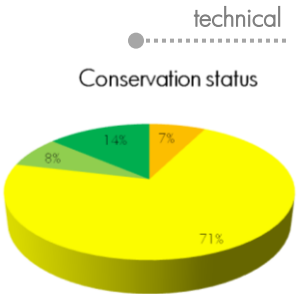


Figure4.28. Consolidated valuation of the UC's. Source: Appendix IV

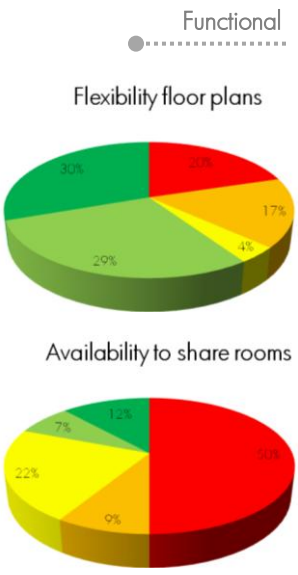
The valuation included all the UC's portfolio except the buildings that function as Commodatum. Accordingly, the replacement value of the portfolio is mainly moderate since the value of 45% of the buildings ranges between €200 and €400 per m2. Besides, 26% ranges between €100 and €200 per m2; 18% ranges between €400 and €600 per m2; 6% has a value of less than €100 per m2; and 5% has a value of more than €600 per m2. The previous assessment indicates that 32% of the buildings of the portfolio are under valuated and could be easily replaced since their economic value do not justify investments. Nevertheless, the assessment of the economic value of the buildings is incomplete due to the lack of data regarding the operation and maintenance costs of the buildings.

Technical value



This assessment excluded 51 buildings; 7 used for other institutions (in Commodatum) without available data; and 44 which are Heritage buildings which, according to the data base used in this research, are excluded of depreciation per usage and conservation status. According to Figure 4.28, a large percentage of the buildings has a moderate technical conditions. This means that, if the university wants to keep all the buildings in its portfolio, it needs to make a large investment since 77% of its buildings are aged and need interventions. Thus, 7% of the buildings need several reparations; 71% of them need simple reparations, 8% are well maintained and do not present several damages; and 14% of them are new buildings, which age is less than10 years. Despite the information gathered in this research, there is no information about the coverage of ICT infrastructure in the buildings neither presences of specialised systems and energy consumption data, which are equally important to measure the technical performance of the portfolio.

Functional value



Based on a rapid scan of the floor plans and information collected through the Geographic Information System of the UNAL (SIG) two aspects were analysed to measure the functional performance of the buildings. First, the assessment of the physical flexibility of the floor plans, which excluded the buildings unused for the institutions (in Commodatum) and specific facilities which specialised structure cannot be adapted for other purposes. Accordingly, more than the half of the buildings has a good level of flexibility since 63% has column grid as main structure and almost all of them have non fine-meshed grids. On the contrary 17% has a combined structure of columns grid and supporting walls; and 20% of the buildings have very limited structure of supportive walls. Second, the assessment of the functional flexibility of the building was analysed based on its availability to share academic spaces. Therefore, only buildings which allocate academic activities were included in the analysis, from which 50% of them do not have lecture rooms; 9% have one lecture room with capacity of 50 to 100 places; 22% have one lecture room with capacity higher than 100 places; 7% have more than one lecture room with capacity of 50-100 places; and 12% has more than one lecture room with capacity of more than 100 places. In this context, there is a change to optimise the use of this spaces.

Future accommodation needs and portfolio regulations

Nowadays, portfolio decisions are regulated within a zoning structure determined by permitted uses and growth possibilities, defined in the regularisation and management plan (PRM). Therefore, specific areas for expansion of the portfolio are defined within the campus which is divided in 15 homogeneous zones defined by six types of land occupation (Figure4.30). Nowadays, this land occupation plan is the most relevant policy for campus real estate decision. However, the portfolio decisions are only seen from the point of view of the land use.

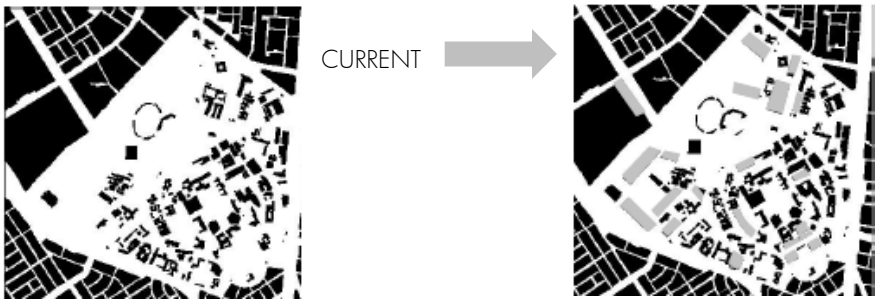


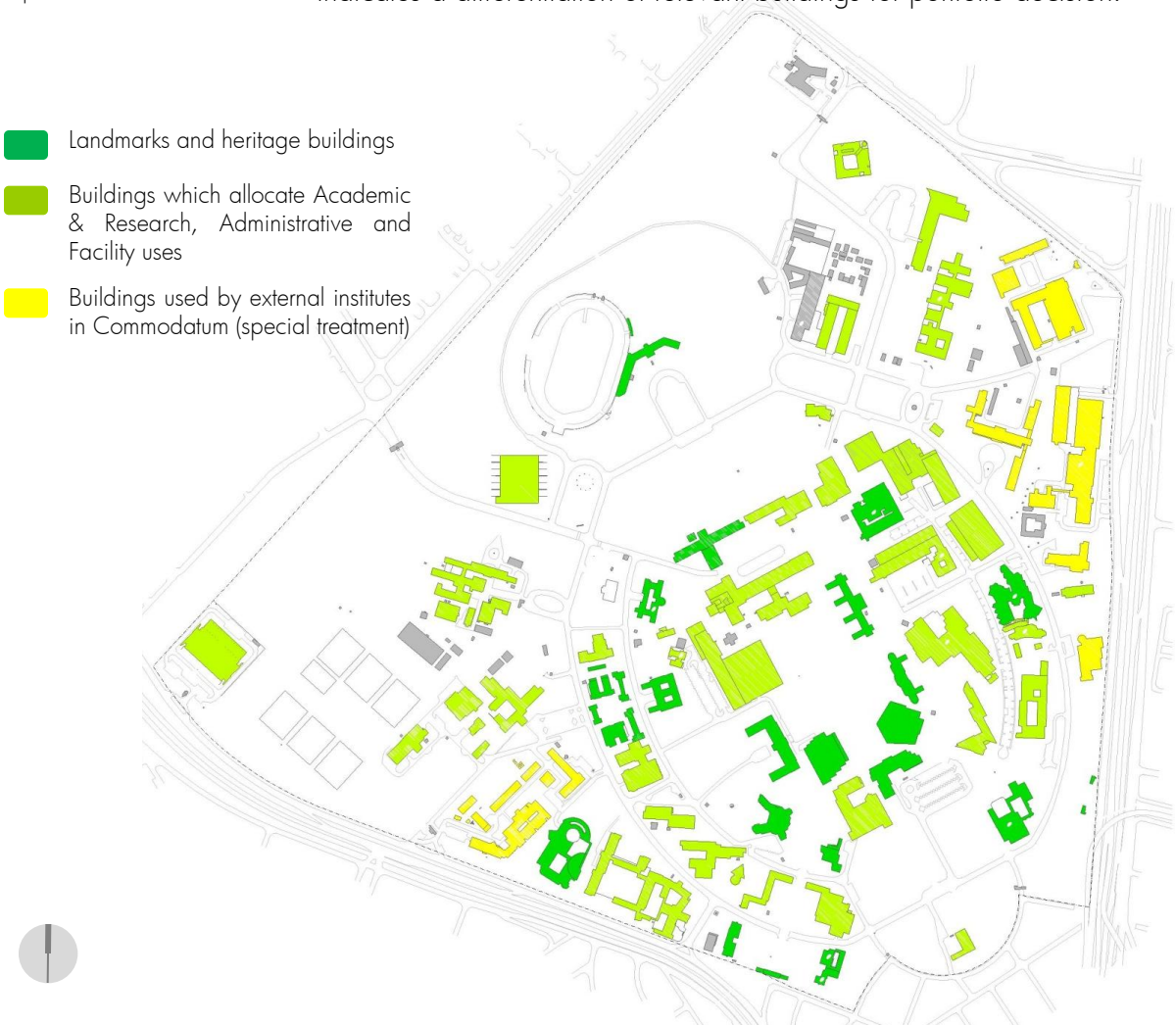
Figure 4.29. Permitted areas for portfolio expansion. Source: PRM, 2005

Figure4.30. Homogeneous zones of the campus and density of land use. Source: PRM, 2005

According to existent projections on student population, (SIG, 2003) the UCB expected an increment of 24.392 new students in 2014. Thus, in less than 4 years the university will nearly double the current number of student population (27.482 students). Furthermore, the recent orientation of higher education policies that encourage the development of research activities has foreseen an increase of research programmes in numbers that were not taken into account during the formulation of the PRM. According to the Admissions Directive, the UCB expects an additional growth of 10.000 students in postgraduate programmes but maintaining the same population in bachelor programmes. Nowadays the University City counts with an area of 205.000m2 only for academic use with an index of 7.5m2 per student. For instance, maintaining the current index, the UCB needs at least 256.526m2 of new space supply to fulfil only the future academic demands.

Therefore, for real estate accommodation and investment decisions, this analysis will give priority to a selection of buildings according to their symbolic and functional value which actually support the institutional vision focused on distinctiveness and productivity of learning and working environments. Accordingly, Figure 4.31 indicates a differentiation of relevant buildings for portfolio decision.

Figure 4.31. Relevant symbolic and functional buildings of the UCB for portfolio decisions.



4.3.2 Location Analysis

The following paragraphs will illustrate the relationship of the University City with its urban surroundings. This relationship is defined by the campus settlement in relation with the urban structures of Bogotá with the aim to identify its impact at area level. Certainly, the impact of the campus takes place at three dimensions through which the analysis is organised. First, a spatial dimension which involves the relationship of the campus with wider environmental and mobility structures as well as its physical settlement at area level. Second, a social dimension which defines the socio-cultural synergies and conflicts of the campus at area and neighbourhood level. This dimension analyses the land use and functions; quality of public space; and population characteristics.. Third, a legal dimension which involves the specific urban policies through which the university defines it urban relationships at city, area and neighbourhood levels.

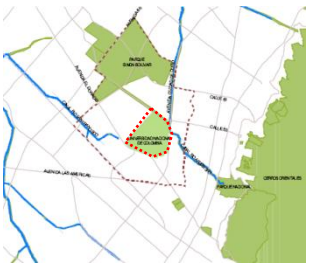
4.3.2.1 Spatial Dimension

Environmental structure

Geographically, Bogotá is located in a savannah between the so-called "Cerros Orientales" (East-Hills) and the Bogotá River in the west, which together limits the growth of the city in both directions. In this environmental structure the hydrographical grids are fundamental, and for this reason the different rivers that have origins in the west hills and cross the city towards the Bogotá river are recognised as important elements (Figure 40). In this frame, the University City campus is located in a central position benefited by the presence of significant natural elements within its influence area; (1) the Arzobispo river which establishes a natural hub with thee East Hills, and (2) the proximity to the Simon Bolivar metropolitan park which besides the University City is the larger and most important green lung of the city. (Figure 41)

Figure40. Main Environmental structure of Bogotá and University City location. Source: POT Elaborated by PRM-UNAL, 2005

Figure41. Presence of natural elements in the influence area of the University City. Source: PRM- UNAL, 2005



Mobility and accessibility structure

The University City occupies a privileged geographic location since it is directly linked with the main and complementary road systems of the city, which guarantee a high level of accessibility. Regarding to the main roads that support the urban and regional mobility, the University City is located next to the most important connection hubs of the city: The NQS Avenue (30th Avenue) in north-south direction and El Dorado Avenue (26th Street) in east-west direction. This last connects the traditional city centre and financial centralities with the international airport "El Dorado". Likewise, the UCB campus is near to other axis of the main road systems such as 68th Avenue, Las Americas avenue and 63th Street. In this way the university has the possibility to integrate itself with the main functional area of the city (Figure 42). Certainly, this position has an excellent connectivity at wide city level but the bordering road system has became the new limits of the campus that has generated a rupture with the immediate urban structure that requires urban infrastructure such as bridges and streetlights among other resources to ensure the continuity of the pedestrian flows. This represents one of the main impediments of the development of the UCB as a metropolitan facility integrated with its area.

Figure45. New Massive transport system Transmilenio, Bogotá 2008.

According to Figure 43. the three groups of users that represents the university community (students, teaching and administrative staff) are distributed almost overall the city. For instance, a mobility system that permit the mobilisation of this large group (more than 30.000 people) is required. In fact, the presence of the massive transport system "Transmilenio" along the two main roads bordering the campus, which is already operating along the NQS Av and in current development along the 26th Street, represents a relevant element for the connectivity of the campus (Figure 45.). Besides, the use of bicycle paths has been implemented with success in the city and the university as well has a advantaged position within the bicycle path system (Figure44)

Figure42. Road system in Bogotá. Source: S.D.P. Elaborated by PRM-UNAL, 2005

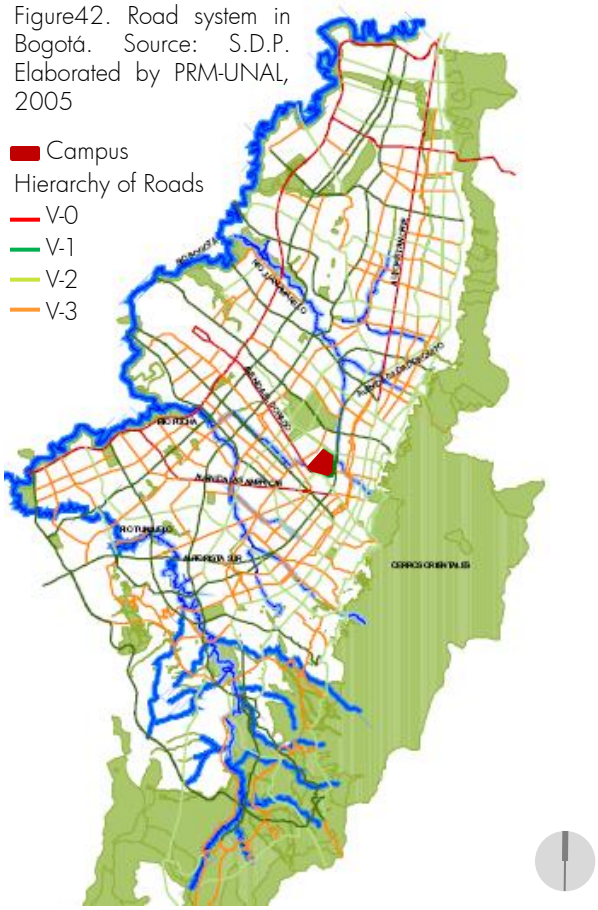
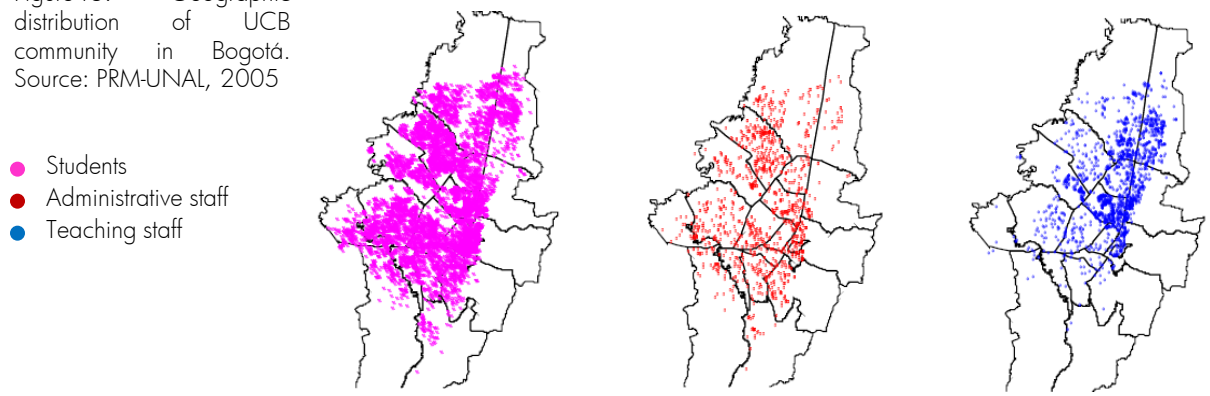


Figure44. Bicycle path system in Bogotá. Source: S.D.P. Elaborated by PRM-UNAL, 2005

Figure43. Geographic distribution of UCB community in Bogotá. Source: PRM-UNAL, 2005



Physical settlement

The urban setting of the campus is a relevant aspect which, in the case of the University City, has define a changing physical relationship with the surrounding and city structures over the time.

Since its creation the University City was planned as a "Greenfield" campus physically separated from the urban environment, which defined its premature social relationship with its surroundings as formal and conservative. However, the urbanisation process of the city towards the west of Bogotá, which development was stimulated by the location of campus and the airport, has brought other type of relationships between the campus and the city, since the University City became a green "inner city" campus (Figure 46). Therefore, for more than two decades the campus has been growth as a gated city within the City, which actual gates constitute a physical barrier for urban integration. Nonetheless, in spite of the introvert character of the campus defined by its previous settlement, the city is reclaiming another type of relationship with the campus, more informal and extrovert with abundant opportunities for cultural cross.

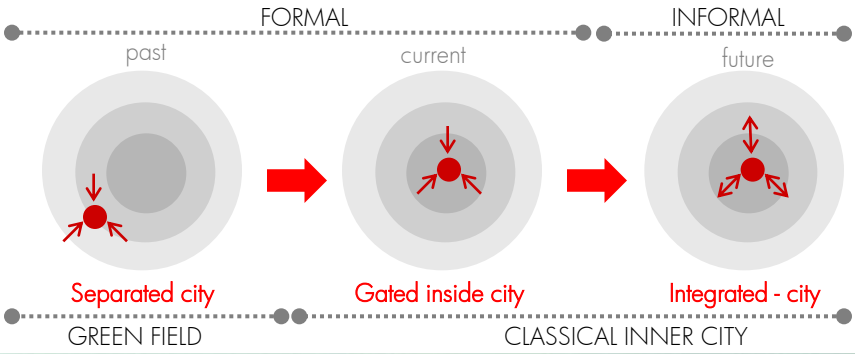
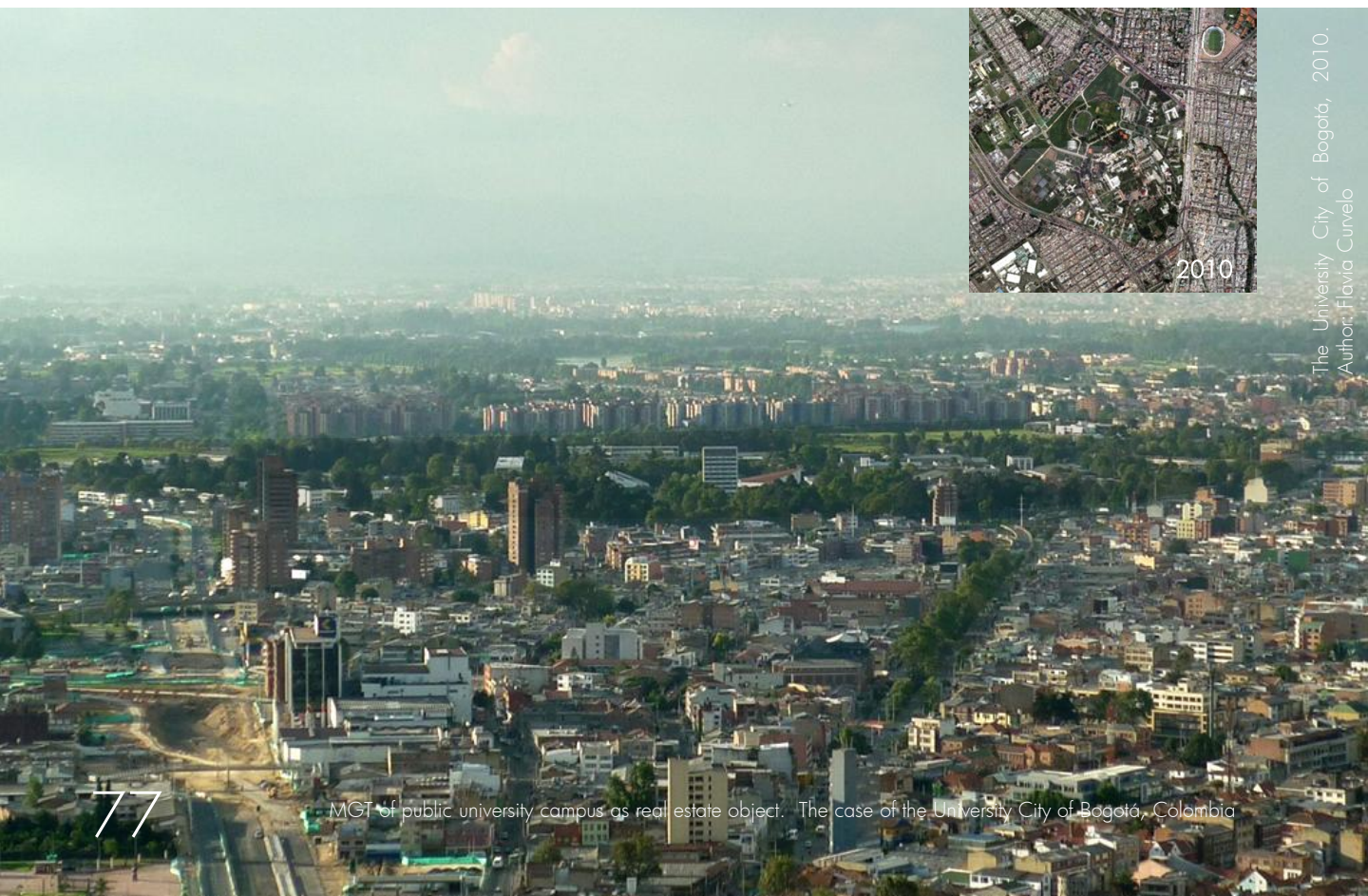


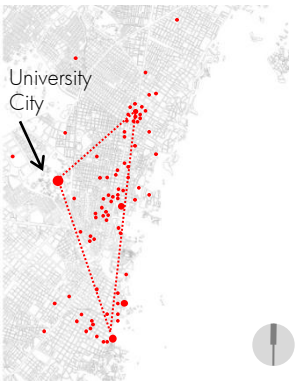
Figure46. Evolution of the physical settlement of the university city.



The University City of Bogotá, 2010. Author: Flavia Curvelo

4.3.2.2 Social Dimension

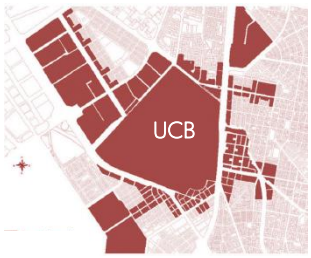
Figure47. HEI's cluster in Bogotá and the location of the University City



The proliferation of higher education institutes in Bogotá, specifically in the area defined previously as an academic cluster (Figure 47), has generated relevant damages in the urban structure. Accordingly, the presence of HEI's has promoted the spread of commerce activities in residential zones, producing changes in the urban morphology; affecting the pedestrian mobility and public space; and visual, increasing environmental visual and noise pollution, which all together threat the quality of life in the city. This has been the result of informal and unplanned growth characterised by a lack of collaboration among urban stakeholders and the inefficiency of delayed urban policy.

In order to specify the social impact of the University City in its neighbourhoods,, this analysis will focused in the "immediate influence area" defined during the diagnosis of the Regularization and Management Plan of the University city, PRM 2005. Accordingly, this area is formed by the nearest zones of eight neighbourhoods: Nicolás de Federman, Belalcázar, La Soledad, Gran América, Acevedo Tejada, El Recuerdo, Quinta Paredes y Rafael Núñez (Figure 48)

Figure48. Delimitation of the immediate influence area of the University City Source: PRM-UNAL, 2005



Campus influence area
Surroundings

Land use and urban functions

This area is defined as mixed use area where residential, educational, health and commerce functions are located. This area has evolved from residential to mixed used as a result of the presence of HEI's in the area. Specially, the emergent of a type of commerce supplying the needs of students and young residents. Nevertheless, the displacement of former residents has diminished the tension generated for the mix of activities since the current users are people related with the activities of the sector. In the specific case of the UCB, the large scale of the campus has permitted to absorb the needs of the university community and dissipate the impact in its surroundings. Even though, the main mobility hubs of the UC's community (45th Street and 26th Street) presents the major changes in urban functions, characterised now by complementary functions to serve this community needs. This complementary functions can be distinguished between academic (photocopies, book stores, printing services, etc.) and leisure (bars, restaurants, entertainment services, etc) see Figure49..

Figure49. Land use in the influence area of the UCB. Source: PRM-UNAL, 2005

Residential
Residential & commerce
Offices
Commerce
Institutional

Generally speaking, the proportion of this impact is minimum considering the university population. In this regards, the university supplies inside the campus multiple services that motivate and permit the permanence of students and staff community in the campus. However, the supply of all needs inside the campus should not be considered as the best solution since this actions strength its isolated condition as "gated city". Rather, the UCB should establishes mechanisms to integrate with the city as a relevant urban facility due to its central position in a complex area with urban richness, that needs to be intervened in order to ensure an adequate development of the different uses and practices of the sector and thus become an cultural and social place of high quality in the city [13].

[13] INJAVIU, Cultural park between the Universities of the 45th Street sector. Diagnosis of the sector in the residential use, 2008

Quality of public space

This analysis involves three aspects for study. First, the quality of the public space infrastructure (paths and squares) has been object of attention for maintenance and new development, after a diagnosis (PRM, 2005) revealed the low quality of the public space infrastructure and its relevance for users and campus image. This last issue was evidenced in the border of the university which low quality has been a result of the existent fence and lack of activities integrated with the city that has converted this area in empty and vague spaces for many years. Therefore, the proposal contained in the PRM involves the recovery of this areas through the design of a new wide boulevard with better quality of materials, urban furniture and landscape works. Indeed, the first phase of this proposal is already constructed and two of them are currently in process of aligning its construction with other urban developments. This initiative to improve the borders of the campus, which is a first step in inviting citizens to use campus spaces, is also encouraged by the improvement and enlargement of the main pedestrian access connected with the main pedestrian flows. Accordingly, a considerable number of squares, pedestrian hubs and paths are parte of the public space plan, which is the strength of the proposal contained in the PRM which seek to find an open relationship of the campus with the city as well as improve the users satisfaction and campus image.

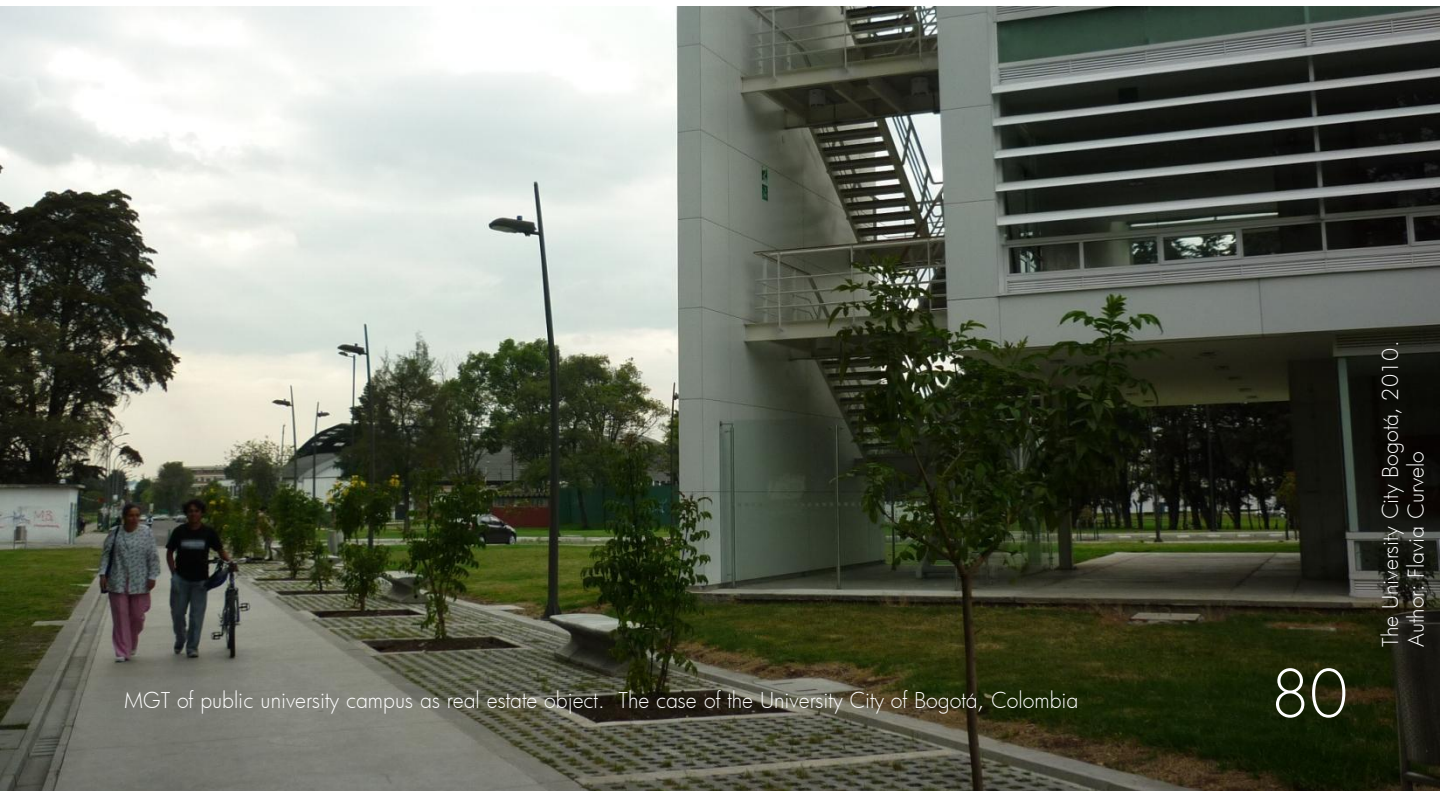
Figure50. Current quality of public space infrastructure in the University City

The University City. Main access 4th Street Bogotá, 2008. Author: beatriz Vasquez

Figure51. Green Areas University City and new sculptures' park

Second, the availability of green zones in the University City is a important aspects due to a low presence of green areas in the immediate neighbourhoods. The change of use from residential to mixed and the high presence of floating users, especially students, explain the insufficiency of the existing green areas to attend leisure and sport activities of the inhabitants in the surrounding area. Therefore, the large proportion of green areas offered in the campus can be highlighted as a positive impact for the sector. According to a residents survey carried out during the formulation of the regularisation and management plan (PRM, 20065) around 25% of the respondent recognises that the large green zones of the campus add value to the sector and complement the small parks located in their influence area for the use and enjoyment of the neighbouring community.

Third, the use assigned to this public space infrastructure highlights the presence of informal street selling in the pedestrian access, specially where the main student flows are located; 45th street and 26th street. This activity takes place on the access squares and the pedestrian bridges, being serious obstacles for mobility of citizens and campus users. The presence of this kind of activities respond to the fact of every day more than 30.000 inhabitants transit along these places, which represents a clear market potential for commerce. In contrast the vague condition of the campus border needs more than physical quality improvement. Certainly, the renewal of the entire border of the UCB campus by implementing a boulevard for the use of the citizens will improve the image of the campus but to ensure the use of more than 1 million square meters, needs a functional land use change that support the large costs of the investments. Therefore, the campus strategic plan should look for specific actions in land-use that involves the allocation of certain functions in the borders of the university that permit not only improve the image but ensure the use of the land as integration mechanism with the city.



The University City Bogotá, 2010.
Author, Flavia Curvelo

Resident population and perceived image

The analysis of the residents' population is limited to the area of the 45th Street were the main impact in population characterisation has taken place due to the presence of other HEI's. The source of the following information is part of the diagnosis in the residential use of the mentioned sector [14] Figure 52.

The resident population in this area has not experienced a significant growth during the last 50 years. Even with the main changes in the land use structure, from residential to commerce and facilities, and the changes occurred in familiar composition that shift from 8.7 members per family in 1951 to 3.0 members per family in 2002, the densification process of multi-family residential (or Multi-dwelling unit) have permitted a permanence of the residents population in the area. The familiar groups tend to be diverse, which in most of the cases is not larger than four members. Likewise, the family constitution per age indicates the presence of mainly adults in the area, rather than elderly and children. Furthermore, few people in the sector has labour links with the HEI's and the ones who do it, are linked as administrative or teaching staff rather than general services. Furthermore, the education level of the residents is distributed between secondary, technical and primary levels. Most of them have a secondary educations with exception of some neighbourhoods (Belalcazar and La Soledad) where the presence of residents with higher education level is dominant. This last aspect indicates the displacement of students after their graduation to better areas, since all of the neighbourhoods in this area are positioned in socio-economic layer 3 except this two mentioned [15].

Moreover, the services provided in the area are mainly distributed in professional and technical services, food services; and local commerce in a little share. Most of them are small business with two or three employees, who level of formation is secondary education. Therefore, this education level is enough for the type of commerce dominant in the area, which do not require major specialisation. Likewise, most of these activities have had a negative impact in the built environment, which is a threat for the image of the city as well as HEI's (Figure 53).

In collective space is highlighted the use of parks, churches and the HEI's which presence has considered beneficial by having a significant economic, cultural and social value among the residents. However, this perception differs form the users valuation. For instance, the owners of commerce activities relate the presence of universities mostly as an economic benefit for their own business. Accordingly, there is room for local synergies among residents users and HEI's who will be benefited of the improvement of the area.

Undoubtedly, the UCB, as the university with more student population in the area, could take the initiative to work in collaboration with other HEI's, city planners, land owners and community in order to revitalise the sector and attract more students and residents in an area that have the conditions to become an academic and cultural centrality of Bogotá. All in all, there is a need of effective urban instruments to alleviate the spatial impacts combined with strategic actions aimed to enhance social integration.

[14] INJAVIU, Cultural park between the Universities of the 45th Street sector. Diagnosis of the sector in the residential use, 2008

Figure52. Sector 45th street between the National University and the East hills. Source: City, University and students, Garcia, B. 2007

[15] According to the socio economic division of Bogotá, the layer 3 correspond to "middle - low" income .

Student accommodation

There is a large presence of tenants in the area and most of them are students. The presence of HEI's has brought other type of use as well as users of the land. The proliferation of commerce and other activities that supports the student's life needs, generated a displacement of resident owners and open the doors for an informal rental market which is characterised by a high density and low quality of housing accommodation supply mainly in hands of individuals (previous residents owners of the properties). There is very few information regarding the impact of the HEI's in the housing market and its quality in the area due to the informality of the supply.

According to a study carried out by the Institute of Dwelling and Urbanism of Javeriana University (INJAVIU), it is noticed a short permanence of inhabitant in the dwelling units which indicates an important mobility of residents within the neighbourhoods. This is explained by the informality of the accommodation supply, since in most of the cases, the students as tenants are not committed through formal contracts.

In spite of the lack of data that support the housing market analysis, through excursion in the area and consultation of real estate websites, four type of student accommodation were identified:

•T1- Informal residences: supply of individual or shared rooms in houses or small buildings, administrated by individual owners. This type of accommodation is popular for students of first semesters who come from other cities and in most of the cases, the accommodation is arranged by their families, since they are all furnished and provide all services including meals and washing.

•T2 - University residences: this is a single case well known as "Residencias 10 de Mayo" and is an accommodation of small shared units provided by the National University of Colombia outside the campus, exclusively for students of this university who do not have the financial capacity to pay a rent (Figure 54). This accommodation is subsidised by the university and most of the residents living there come from other regions and belongs to minority groups (native and afro-descendents students). Despites its subsidised character, the quality of this accommodation is very low and its improvement is not mentioned in any of the University plans either within the inventory of University's real estate. This lack of attention for the student accommodation is a result of failed attempts of the institutions providing housing for students which were initially located inside the campus. In words of one of the

Figure53. Architectural profile in the 45th street sector. Source: PRM, 2005

former Vice-rectors of the UCB, Fernando Viviescas Monsalve: *"Accommodating the student population is not the mission of the Universities. Some universities such as National University of Colombia tried before but the results were negative since universities do not have the capacity and experience to attend such demands. However, universities could promote and even supervise a student accommodation supply in hands of companies with experience on that. This field had not been studied in Bogotá which has generated informal solutions in the real estate market".*

Figure54. Residencias 10 de Mayo, university residences of the UNAL. Source: Wikimedia Commons

•T3 – Sub-rented rooms: this type of accommodation is provided by individual owners or tenants in family houses or apartments. In most of the cases the rooms is fully furnished and the student is allowed to share common spaces with the landlord who also provides all services including meals and washing. This is the most informal student accommodation, since the students are not committed with rent contracts.
•T4 – Rented apartments: this accommodation is formal and provided by both individual owners or private real estate agencies. The quality of this accommodation is rather better than the other types and the tenants are engaged to a rental contract. Generally, this supply does not include furniture neither services. Therefore, it is more expensive for students and demands additional requirements difficult to support by students on their own. For that reason, most of the cases this supply is rented by a group of students by the support of their parents.
The size and prices of the supply, both for apartments and rooms, vary from one to another neighbourhood. For rooms, the area varies from 10m2 to 30m2 and the rent per m2 ranges from €3 up to €8. Likewise, for apartments the area varies from 40m2 to 200m2 and the rent per m2 ranges also from €3 up to €13, which is very high compared with the quality offered.

Generally speaking, the informality of the student accommodation is the result of two factors. First, the lack of financial and legal capacity of students to be active in the formal housing market which do not provide specialised services for this demands and therefore, it limits the accessibility to the rental sector. Second, the lack of support from universities which certainly cannot provide accommodation service but can be active promoting the provision of student housing through students associations or other social models. In conclusion, there is a need of reflection on this topic in order to recognise its absence and the relevance of students accommodation influencing the quality of the education and attracting students.
In this regard, examples from best practices in other contexts can be used as sources for creative initiatives that can be adapted in the Colombian case. In fact, the *student union* of the University of Helsinki is an example of how empowered and rooted students organisations may facilitate the integration of student communities, providing services and support of all kinds, including housing accommodation. The association is able to negotiate as peer with local politicians the decisions affecting the student community.

>> REFERENCE CASE

The student union of Helsinki is one of the eldest student associations of Europe (1868) It currently has 32,000 members and is one of the world's richest student organizations (New York Times, Published May 25, 1998)
+info: www.hyy.helsinki.fi

4.3.2.3 Legal Dimension

This dimension is aimed to identify the role played by city policy in the transformation of the area where the University City campus is located. For that purpose, two urban instruments in form of policy are identified.

Strategic Plan of Bogotá – POT (Plan de Ordenamiento Territorial)

This instrument has it legal basis in the Agreement 6 of 1990 which is has been conducted since then and currently is in process of modification. According to this plan, the University City is located in the metropolitan centre of the city in a concentration point of important activities of primary hierarchy regarding public administration; commerce, financial and hotel services, and supply of basic facilities of metropolitan character, among others (Figure 55).

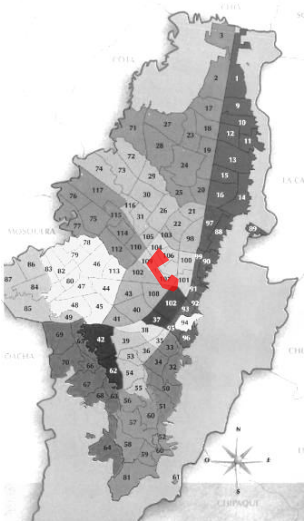
In this context, the strategic operations contained in the POT connect special urban actions, management instruments and socio-economic interventions of the city that are considered fundamental to consolidate at short, middle and long term, the planning strategy of Bogotá. Thus, the POT has identified 10 operations in the city, from which two of them are physically bound to the University City: (1) Innovation West Ring Operation and (2) Centre Operation. As can be illustrated in Figure 55 these two operations could be opportunities for the UCB to play an important role in urban development due to the potential of its location and the services offered in the campus.

Figure55. Strategic operations POT Source: S.D.P. Elaborated by PRM, 2005

Zoning Planning Units – UPZ´s

Bogotá is administrative divided in 19 localities and at the same time, this localities are subdivide in UPZ's in order to facilitate the regulations of large scale areas in the city. Therefore, this instrument has an influence at area level and deals with the specific decision and projects for the development of a sector which defines three different type of treatments: (1) Consolidation, (2) Urban renewal and (3) Conservation. Nowadays, Bogotá counts with 117 UPZ´s; 89 of them are already regulated and the others still in formulation process. For this case, it is highlighted the UPZ-104 "Simón Bolivar" within the locality of Teusaquillo, which is already approved defining the urban treatments for three relevant public facilities; the Simon Bolivar metropolitan park, the National Administrative Centre (CAN) and the University City campus (Figure 56).

Figure 56. Administrative division Bogotá per UPZ´s Source: S.D.P. , 2009



Accordingly the University City as well as the CAN are defined as areas for "urban consolidation" with special treatment which land use plan per each zone has to be specified through other urban instrument: *The Regularization and Management Plan* (PRM) which are planning instruments of third level defined in the POT for metropolitan facilities. Both PRM´s were formulated and approved in 2005 and 2009, respectively and constitutes the main urban policy that defines the use of the land and establish the conditions for the well operation of the facility in relation with its surroundings and wide urban structures. In the case of the University City, this PRM constitutes the policy basis for real estate decisions and future expansion, which will be explained in detail in the real estate policy analysis at the end of this chapter.

Conclusions and remarks on location impacts

The location of the University City presents exceptional conditions in terms of connectivity and integration with the functional area of the city. Besides, the evolution of its physical settlement within the urbanisation process in Bogotá has established a changing relationship with its immediate surroundings which main social impacts are related with the presence of other higher education institutions and the development of mobility infrastructure in the area. Based in the previous analysis and information gathered from the Diagnosis of the PRM, 2005, three levels of impact can be identified in the case of the University City at area level; high, moderate and low impact.

Accordingly, a high impact is identified in sectors along the 45th street and 26th street, since they constitute the main functional corridors of the university community linked to the main pedestrian access of the campus and where commercial activities have established in order to attend the demands of the university community modifying the characteristic of the traditional residential neighbourhoods. In the same manner, around these areas is concentrated the demand for student accommodations.
The moderate impacts are related with partial transformations of the urban fabric in the influence area in which the modification and presence of commerce activities are not strong. This impact is mainly located in the secondary blocks of the main axis mentioned above. Likewise, the area along the 40th Avenue is categorised as moderate impact since despite the strong presence of commerce activities, it is associated with the presence of the National administrative Centre (CAN) and the institutions which belong to it.
Finally, the low impact is located in the residential areas of Rafael Núñez and Nicolás de Federmán. Accordingly, this areas had not been modified by the presence of the university and in contrast they preserve their character.

Certainly, the regulation of the area through urban instruments such as UPZ's and PRM are aimed to reduce the negative impact of the universities in these area. Notwithstanding, there is a need of a collective project involving urban stakeholders interested in the improvement of the area (higher education institutions, community, land owners, service providers, politicians and urban planners) to develop specific social programmes and physical projects, specially the 45th's street sector, where the high presence of HEI's, cultural facilities and mixed use of the land reveals the potential of an area that could be developed as an academic and cultural cluster. All in all, an integration of policy is need it since the urban instruments available defines different treatments in a separate manner due to the current administrative division of the area.

4.3.3 Real Estate policy analysis

Description
According to previous analysis and information given during interviews with Vice-Rector and Planning office director of University City of Bogotá (Appendix III), specific official documents were consulted from the university 's online data base available at www.unal.edu.co that permitted to identify three layers of policy involving real estate decisions. All levels are connected by a hierarchical correspondence. However, each one have different legal basis and provides different legal instruments which are used to control and manage campus physical resources. Therefore, these policy levels are presented as follows according to their hierarchy:

Institutional level: General Statute, National University of Colombia (UNAL)

External Legal basis: Decree 1210, 1993 - Modification of the special organisational regime of National University of Colombia, issued by the President of the Republic of Colombia
Internal Legal basis: Agreement 011, 2005 - Adoption of General Statute, issued by the Superior University Council
Application scale: National level (All seven headquarters)

Contents Highlights:
- Definition of nature and mission of the university based on community and democracy principles.
- Definition of financial, administrative and academic autonomy of the institution
- Definition of organisation and directive of the university into three levels: National, Headquarters and Faculties

According to these levels in which the university is organised, three relevant tools at institutional policy level were identified for real estate management:
-Global Development Plan, which is approved, modified and evaluated at national level by the Superior University Council.
-Headquarters' Action Plan, which is defined by each headquarters providing measures to execute plans, programmes and projects authorised by the Headquarters Council.
-Faculty's Action Plan, which is defined by each Faculty and it provides measures to manage the property assigned to them approved by the Faculty Council.
These three tools also have a hierarchy and correspondence. For instance, the formulation of the Faculty's Action Plan have to be harmonised according to the Headquarters' Action Plan, which is likewise corresponding to the Global Development Plan. Therefore, all of them are focused in aligning academic and spatial plans, programmes or actions with higher institutional vision.

Nowadays, the General Statute is in evaluation process and there is a proposal of modification regarding to improving some aspects such as:
- Simplification of the three levels of academic and administrative organisation.
- Enhancing external promotion through strategic management and better allocation of resources.
- Promoting a Planning statute with the aim to introduce long term planning and overcome the barriers of administrative periods.

Therefore, these modifications recognises strategic management and planning as sources to improve university performance and are subject to be introduced in higher institutional policies.

City level: Regularisation and Management Plan (PRM) of the University City

External Legal basis: Decree 619, 2000 - Adoption of Strategic Plan Bogotá, issued by the Major of Bogotá . Decree 469, 2003 – Review of Strategic Plan Bogotá. Decree 254, 2004 - Regulation of Zoning Planning Unit No.104 (UPZ-104) , issued by the Major of Bogotá
Internal Legal basis: Agreement 025, 2005 Adoption and application rules of the PRM, issued by the Superior University Council
Application scale: Headquarters level (University City)

Contents Highlights:
- Definition of University City as a collective facility. Type: educational. Service Unit: Higher Education Institution (University). Scale: Metropolitan
- Diagnosis of current situation of campus: (1) Relationship with wide urban systems, (2) urban impact in its influence area, (3) Spatial structure of portfolio, (4) Internal mobility system, (5) Heritage and architectonic portfolio analysis and (6) Functional portfolio analysis
- Proposal of new spatial model for the University City at three scale levels: (1) Urban, (2) Area and (3) Portfolio (specific interventions)

Due to the PRM is an urban planning instrument, its objective is regulating and establishing conditions for the operation of the campus as a metropolitan facility, with the aim of moderating its impact in the surrounding through specific proposals and actions. Therefore, to make this happens four relevant tools at urban policy level for real estate management were identified:
- Public space plan, which considers a consolidation of ecologic, spatial and mobility structures at urban level. It contains concrete interventions improving spatial relationship with the surroundings.
- Land occupation plan, which contains a definition of six homogenous zones for the campus with specific uses and growing possibilities in terms of occupation, density and construction indexes.
- Implementation Plan, which organises the priorities of the spatial projects into four phases in a period of ten years. This priority is given to large public space projects that are fundamental to establish a clear connection of the campus with city systems.

- Spatial management model, which determines the generation of new policies in order to (1) manage the physical space, (2) integrate the spatial supply with the academic project, (3) recovery the spatial sense of planning and finally (4) establish rules and verify its fulfilment.

In spite of the Public Space and the Occupation Land plans have been used as main guidelines for any campus intervention, the Implementation plan is too vague and based more in urban and spatial considerations. Therefore, the way in which this project has been executed is deviated from the initial phasing. Besides of the priority given to urban and spatial ideals, the projects has been developed according to a mix of facilitating factors such as availability of resources, sharing of stakeholders agendas, technical reasons and support of the parties involved. In fact, this is one of the results of needing a new spatial management plan. Indeed, after the adoption of the PRM, the changes in the management structure is already taking place in order to facilitate the development of a new campus model. As a consequence, a new spatial policy was developed which is the third policy level explained as follows.

Portfolio level: Physical Spaces policy for the University City

Internal Legal basis: Resolution 2809, 2006 - Adoption University City physical space policy. Agreement 025, 2005 Adoption and application rules of the PRM, issued by the Superior University Council.
Application scale: Headquarters level (University City)

Contents Highlights:
-Regulation of allocation, control and management of physical spaces processes
-Authorization and execution of physical interventions
-Designation of Vice-rector as the exclusive competence to authorize the allocation and interventions of physical spaces
-Establishment of legal procedure for allocation, management, control and use of physical space.

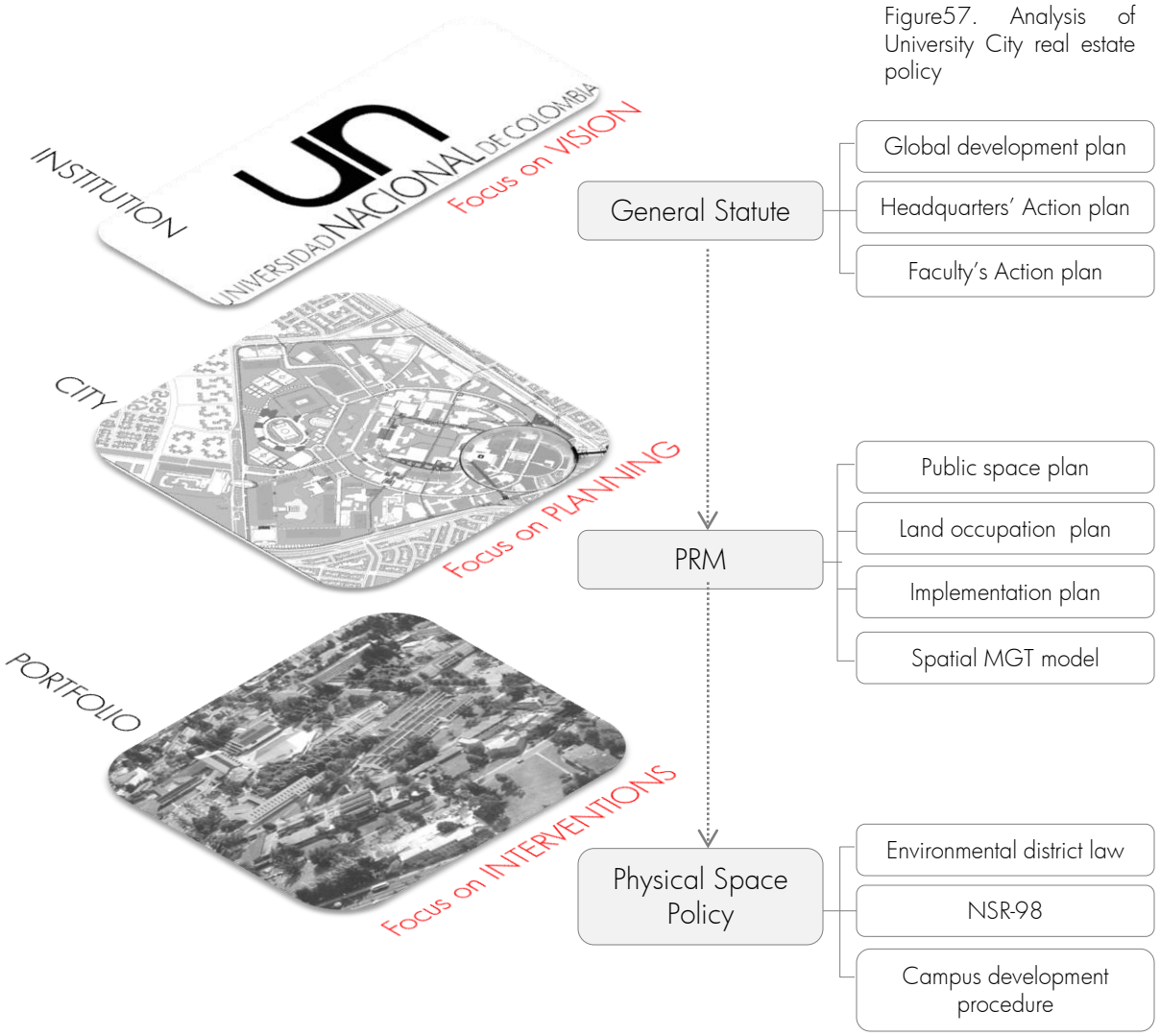
Accordingly, three relevant tools at portfolio policy level were identified as requirement for real estate development and management:
- Environmental district laws as requirement for any intervention
- NSR-98, which is the seismic and building law necessary to obtain the building permits from the district authorities
- Campus development process, which follows this procedure: (1) Demand, (2) Feasibility and prioritization, (3) Study, (4) Approval, (5) Supply and (6) Restitution. Thus, the campus real estate decision-making process is positioned in steps 2, 3 and 4.

It can be said that the policy at portfolio level is more regulatory at operational level than the policy at institutional or city level. In fact, Environmental district laws and the NSR-98 are external mandatory requirements for interventions. Meanwhile the establishment of a legal campus development procedure is an internal device of process management to control the physical development of the campus.

Thus, this last tool which is focused in the process, has been used as a basis of the new spatial management model proposed in the regularisation and management plan. Nonetheless, the model defined on paper has been improved in practice since after its application the organisation of this process is more interactive and less administrative. Therefore, practice has generated a dynamism that requires flexibility at policy level.

In conclusion, the real estate policy of the University City responds to three hierarchical contexts which are focused in different aspects. Therefore, the campus decision-making process is tied, through these policy levels, to find a balance between the institutional vision, city planning and portfolio interventions. In fact, these approach has sense in theory. However, in spite of all policy levels are supporting the end institutional goals, this division of arenas could limit the scope of some tools. Indeed, the third level of policy provides operational tools while the others are more strategic.
In order to have a clear understanding of the real estate policy analysis of the University City, the three levels of policy and their tools for real estate management has been illustrated in Figure 57 as follows.

Figure57. Analysis of University City real estate policy



4.3.3.1 Real Estate Policy implementation

According to the previous policy analysis, much has been stated in different documents and serves a guideline for campus development in a hierarchical organisation involving three policy levels: institutional vision, city planning and portfolio interventions. Likewise, the second real estate policy level, which is materialised in the Regularisation and Management Plan, is positioned as an intermediate instrument to match the institutional strategic planning with operational interventions. Nonetheless, in spite of the achievements reached through the adoption of this policy, which recognition has been a giant step for campus development, the institution still working hard in planning, self-assessment and accountability culture in all directive levels. Thus, the definition of a Planning Statute and Financial Regime are crucial elements that will permit the establishment of long term strategies, in order to act in response of the dynamic demands affecting higher education institutions. Therefore, the university is nowadays working in the design of a integrated system of management indicators mentioned within the Global development Plan 2010-2012; "although the university counts with a low indebtedness level, a better management is needed in the attainment of financial resources" [16] .

[16] National University of Colombia Global Development plan, 2010-2012, Bogotá 2009, p.28

As a result of global and local dynamics affecting universities, there is a need of an academic-administrative management model that permits to react, in a suitable and efficient manner, to the new challenges and demands in the national and international contexts. Nowadays, this model is on development through the implementation of a program called SIMEGE or Better Management System. This program counts with policies, strategies, methodologies and techniques with a systematic approach of planning, execution and evaluation, in order to strength the academic-administrative management and capacity of the university.

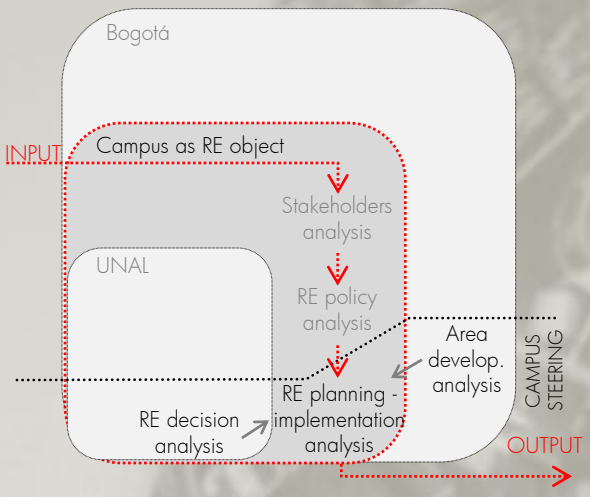
In spite of the achievements in terms of a continuous improvement of campus management, very little has been achieved in terms of management of physical and financial resources. The university needs to assume the attainment of new resources in different national or even international sources. Moreover, it needs to implement strategies and adopt better practices that conduct to an efficient management and an effective use of the institutional resources. Indeed, these needs are covered by two other programmes within the same institutional line: (1) The strengthening of physical infrastructure and (2) the strengthening of a efficient management of resources and searching for new ones.

Indeed, the "strengthening of physical infrastructure program" is aimed to orientate efforts for the construction, renewal, maintenance and supply of physical space that contribute to the development of institutional functions and welfare of the university's community. It does so by organising and regulating the use of the land in relation with current governmental policies which has had a success through the implementation of the PRM and the Physical Space policy.

Besides, the "strengthening of efficient management of resources" has the objective the attain new resources in different national or international sources within the frame of an institutional policy. It does so by the implementation of strategies and adoption of better practices that conduct to a more efficient negotiation and effective use of institutional resources. In this line the university is pursuing specific goals: (1) to attain at least €1.2 millions with associations; and (2) to attain external resources for research activities.

Despite the efforts to strength the efficient management of resources, which are materialised in separated actions and practices, there is a need of a integrated plan supported by an institutional policy in order to overcome the limitations of the short planning resulting from the fixed administrative periods. Thus, the definition and good orientation of the so-called "Planning Statute and Financial Regime" is primary for the establishment of long term strategies.

4.4 The University City and its campus management process



4.4.1 Real Estate decisions analysis

The aim of this analysis is to identify the way in which the campus decision making process is organised within the institution and thus, positioning the direct or indirect involvement of different stakeholders and their specific functions and managerial competences.

Description

According to interview with the directors of the Institutional & Territory Planning office and the Project's group (see Appendix III), there is an Advisory committee of physical spaces (CAEF) delegated by the Headquarters Council to take and evaluate any decisions concerning the physical infrastructure. This CAEF is integrated by the Vice-rector (head of the board), three Deans (Faculties of Architecture, Engineering and Economic Sciences in order to advise the spatial, technical and financial quality of the proposal respectively according to their specialisation fields), the Director of the Institutional and planning office, the Director of the Management Office, the Director of Maintenance of physical resources office and two invited which are assessors of the Vice-rector.

This committee meets every eight days to discuss proposals (made by faculties or the planning & project group), to evaluate the progress of the physical interventions and to negotiate and promote them. The head of the committee (Vice-rector) counts with three Advisory offices: Secretary, Legal and Planning office. The last one provides specialised advice and counts with a Technical Committee integrated by architects, engineers and technical professionals who study the spatial, technical and financial feasibility of the proposals. Consequently, this technical committee give out a judgement of the proposal and the CAEF takes a final decision which is informed to the Headquarters Council. Most of the time, and when the proposals involves large and important developments this decisions approved by the Headquarters Council have to be informed to the Superior University Council which is the main authority of the institution and is integrated by the Rector of the National University of Colombia, the Minister of Education of Colombia and other members delegated by the President and other boards.

Once the real estate decision is approved by the headquarters' boards and depending on its scale, the proposal passes to the territory planning & project group or to an external consultancy firm (or even to a National architectural tender) in order to execute the architectural and technical designs. If the case is the second, the territory planning & projects group will acts as design supervisor by accompanying the design process in charge of a external consultancy firm. Therefore, once the design is complete and approved by the Project group's director, it passes to the Hiring office in order to elaborate the "Reference terms" which will be the legal basis to open a public construction tender. Consequently, once the tendering process is complete and an external firm is selected to execute the construction works, the Project management office will acts as supervisor during this execution phase.

Finally, when the execution of the project is complete, it is received by the Maintenance of physical resources division, which will monitor the technical condition of the building and spaces since its completion.
In order to have a clear picture of this process, the previous explanations given by the stakeholders interviewed are summarised in Figure58 as follows. Accordingly, the real estate decision-making process is one of the three parts in which the overall campus development is divided. For instance, the other two parts are the supply and demand sides which appear as input and output of the decision-making process respectively. Within this frame, five phases can be identified and positioned:

- Phase 1: Planning (demand side)
- Phase 2: Feasibility (decision-making process)
- Phase 3: Design
- Phase 4: Realisation } (supply side)
- Phase 5: Monitoring

As it is illustrated in Figure30, many internal and external stakeholders are involved in the campus development process. However, the demand side and the decision making process are driven by internal stakeholders while the participation of external parties only takes place in the supply side. Moreover, the position of the four campus management fields, which are illustrated in different colours, can be identified within the overall process and how their functions are delegated to different departments or individuals. For instance, one can identify the influence of these management fields and their competences at each stage. For example, the demand side is focused more in the institution and at strategic level, while the supply side is focused more in real estate and at operational level. However, all four management fields take part during the decision-making process since the internal organisation of the Advisory committee of physical spaces (CAEF) has the same hierarchical relationship among its participants.
According to interview with the director of the Institutional & Territory Planning office, all values (institutional, financial, functional and technical) are taking into account during the decision making process. This is the end meaning of the advisory committee. However, according to the scale and relevance of the projects as well as the source of the demand, some values have priority. For example, when there is a large project where political interests matter, the institutional value is priority. Of course all physical interventions respond to an academic demand, where the functional value is the origin of the proposals. However, the supply of these needs has to be feasible in technical and economic terms. In this sense, all the values mentioned have to be balanced in the process. Nevertheless, in spite of the involvement of all parties in the decision making process, the bureaucratic division and delegation of functions observed in Figure58 can be an obstacle in terms of efficiency, use of human resources and time consuming. Accordingly, these organisational structures are fixed and sometimes difficult to change. Nevertheless, there is always room to simplify the process in order to make it more efficient and effective.

A relevant aspect to mention is the role of external aspects influencing the real estate decisions inside the campus. Thus, as it has been supported by theory and through the preliminary findings of this analysis, many external issues deals with the development of campus as real estate objects. In this way, the involvement of external demands should be considered as inputs for real estate decisions. Likewise, due to the institutional character of the university, the involvement of external actors -such as representatives of community or district authorities- as invited assessors within the CAEF should be considered to strength external collaboration, specially when large scale campus projects with high or middle impact at area or city level are topic of discussion. Therefore, the opportunities for aligning campus development with area development will be presented in the next paragraphs.

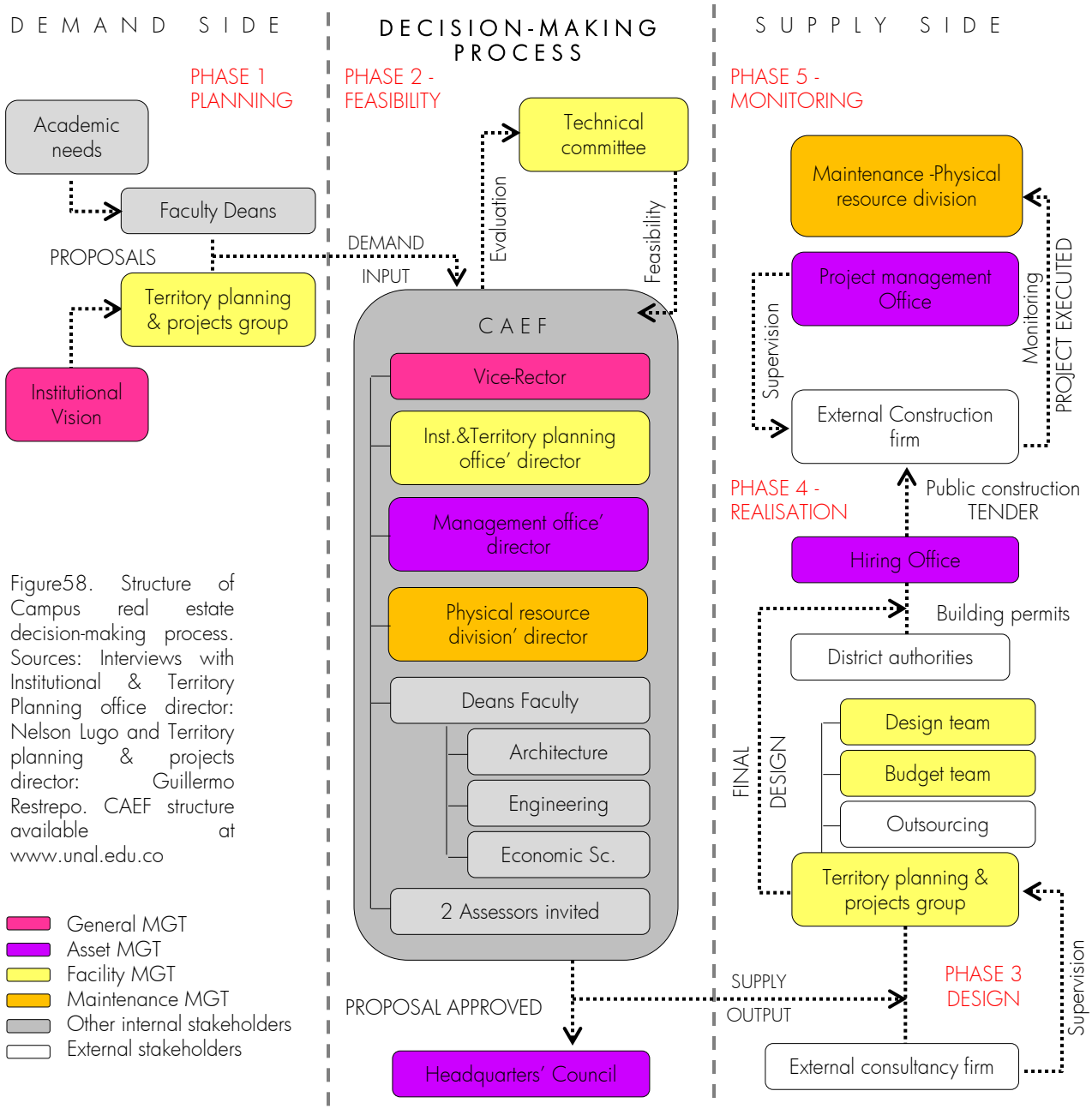


Figure58. Structure of Campus real estate decision-making process. Sources: Interviews with Institutional & Territory Planning office director: Nelson Lugo and Territory planning & projects director: Guillermo Restrepo. CAEF structure available at www.unal.edu.co

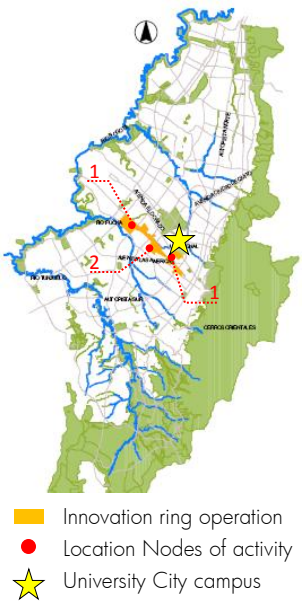
4.4.2 Area development analysis

This part of the analysis is aimed to identify the opportunities at area level for the UC's campus managers in order to optimise their resources by orientating their strategies and processes. For instance, knowledge about future developments in the area is crucial since campus managers will be prepare to prevent conflicts and strength synergies between campus and urban developments in the long term. Likewise, the identification of strategic partners for future campus development could permit to strength collaboration between university and third parties, which can be involved in campus planning since now.

Innovation Ring Operation and "Innobo"

The innovation ring is a large scale operation framed in the Strategic Plan of Bogotá (POT) which seeks allocate, between the traditional centre and the airport, new tertiary and specialised activities that trigger the economic development of the city and its region. The location of this operation is determined by the industrial cluster located along the 13th Street and Americas Avenue; the location of offices along the 26th Avenue and the functioning of the international airport El Dorado and the main Bus Transport Terminal, which are the two main connectivity nodes at national and international level. Likewise, the urban structure for these operations identifiy three nodes of activities: (1) Expo-Fair Node around CORFERIAS [17], where the location of new corporate and financial services are proposed; (2) Puente Aranda Node which propose the development of tertiary industrial activities; and (3) Boyacá node where logistics and extensive commerce are proposed. Therefore, as it can be seen in Figure 59 the location of the University City is linked to the development of the first node.

Figure 59. Location innovation ring operation (POT). Source: S.D.P. 2005



Accordingly, the development of the first node was launched in 2008 under the name of "Innobo Project" which has the aim to positioned Bogotá as one of the most important business centre in Latin America. This initiative emerged as a cooperation between public-private sectors which will permit to establish Bogotá as an attractive city for business tourism and the consolidation of a corporate cluster in the capital [18] . Thus, this project which is framed within "Ciudad Global" structuring line of the Development Plan of the city, counts with the participation of several institutions including the UNAL: the District Habitat Secretary, the District Economic Development Secretary, the District Tourism Institute, the Bogotá Urban Renewal Company, the Bogotá water and sewerage Company, the National University of Colombia Bogotá headquarters, the Bogotá Chamber of Commerce, CORFERIAS and the Local Municipality of Teusaquillo [19]

In this context important projects will be developed in the area such as the renewal and enlargement of CORFERIAS, which will count with and advanced and integrated service platforms, technology and increment of hotel supply; the construction of a Convention Centre, which will be the largest of Latin-America; and the development of other real estate projects such as commerce and business centres.

[17] CORFERIAS is The Bogotá International Center for Business and Exhibitions

[18] MisionPyme.com, October 2008. accessed on April 2010

[19] Bogotá Positiva.com, October 2008 accessed on April 2010

These real estate developments will be supported with large infrastructure projects in terms of mobility and connectivity at urban, regional and national scales, such as the development of "Transmilenio transport system" along the 26th Street (El Dorado Avenue) which is nowadays under construction. Moreover, the area will be improved in terms of public space, green zones, bicycle paths and boulevards, in which development and supply the university could play an important role. In fact, the National University of Colombia, is participating in a design of a urban model which includes the design of public space, urban facilities and public services as well as a proposal for its management through phasing, participation schemes, promotion and financing of the project [20].

[20] BogotáPositiva.com, October 2008, accessed on April 2010

[21] Bogotá.gov.co, November 2008, accessed on April 2010

➔

There is no doubt that this project, which land development involves mainly private investment, will have an urban, economic and social transformation in the area which can be an exceptional opportunity for the university to improve the quality of its portfolio for the benefit of the University and the city. Therefore, the university could collaborate not only as a provider of knowledge –since the urban designs of the new fairground, which will have 25.000 m2 (Figure 60)- has been developed in a study carried put by the National University of Colombia, Bogotá headquarters [21].- but as infrastructure provider due to large amount of public space, green areas and other urban facilities that could be relevant for the development of the area.

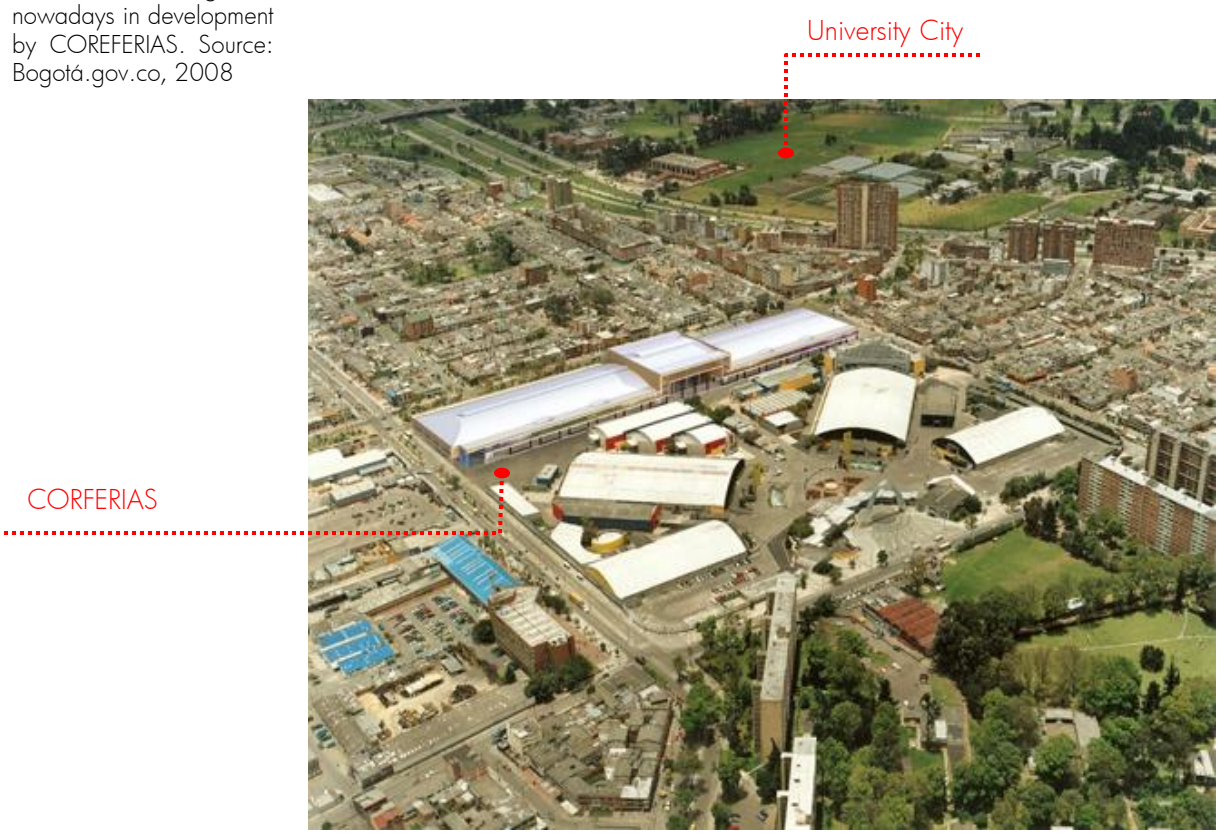


Figure 60. Proposal of new Fairground nowadays in development by COREFERIAS. Source: Bogotá.gov.co, 2008

Agricultural and technological hub "Towards a Tech park of the UNAL Bogotá headquarters 2010-2012"

This is one of the four megaprojects through which the national University of Colombia wants to strength the integration with the region. Accordingly, the agricultural and technological hub for the west savannah is an important initiative of inter-institutional cooperation between the UNAL, SENA [22] and CORPOICA [23], which main objective is link the research processes in benefit of the Agro-industrial sector through the transfer of knowledge to entrepreneurs and small and middle producers. Nowadays, few projects has been developed in different phases through workshops and training in good agricultural practices; improvement of production; and use and production of bio-pesticides. Therefore, the reinforcement of this knowledge transfer activities will take place in the future establishment of a Tech park, which is expected within the next 30 years. In 2006, these three institutions mentioned above, signed a Cooperation Agreement with the object of implement a strategy for the Agricultural and technological hub to support the productive sector, specially the agricultural. Accordingly, this strategy seeks to increase the capacity of the institutions to produce and transfer knowledge to the productive sector. In this way, the institutions will create advantages to support the production chains and the formation of a cluster as well as to maximise the formation of human talent and supply of technologic services. Therefore, this hub is proposed as the territory in which these three knowledge institutions will work and collaborate together with local actors. Therefore, the area cannot be understood as a geographic area with precise and fixed borders but flexible that express the commitment and participation of all stakeholders involved [24].

This initiative has a very good support at wide region through the development of the "Agro-industrial Megaproject of Bogotá and Cundinamarca – MABC" which is one of the projects within the Regional Plan of Bogotá and Cundinamarca 2004-2014. assigned to Export region group of the Foreign Trade Advisory Committee (CARCE). Accordingly, the MABC is an organisation model that pursuit the formation and development of an agricultural cluster through association schemes between small, middle and large producers; firms that transform the products and trading companies, with the support of public and private entities such as IICA (Inter-American Institute of Agricultural Cooperation), CORPOICA, the Bogotá Commerce Chamber, the CARCE, public and private universities, among other organisations [25].

In this context, the National University of Colombia is sharing goals with other institutions and industry, where the formation of a geographical cluster is highlighted. Thus, the university has a privileged position since the UNAL owns almost 100 hectares of land in this area where research activities in the agricultural field already take place. However, for the development of an agro-industrial cluster requires economic, logistic and technologic platforms that needs to be triggered and promoted by the joined collaboration of regional and national entities and economic sectors interested in this development. See Figures 61 and 62.

[22] SENA (Servicio Nacional de Aprendizaje) is the largest and most important HEI of technical character in the Country. It has 245.628 students only in Bogotá. Source: SINIES, 2008

[23] CORPOICA is the Colombian Corporation of Agricultural research.

[24] Research Vice-rectory, UNAL Bogotá Source: http://www.unal.edu.co/viceinvestigacion/ct/ct.htm Accessed on April 2010

[25] Bogotá commerce of Chamber, 2005

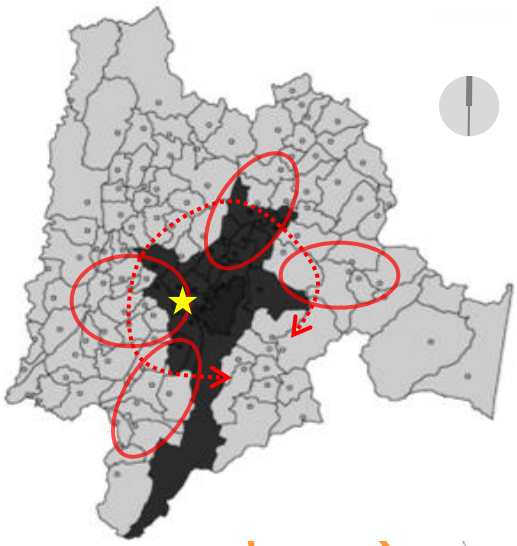
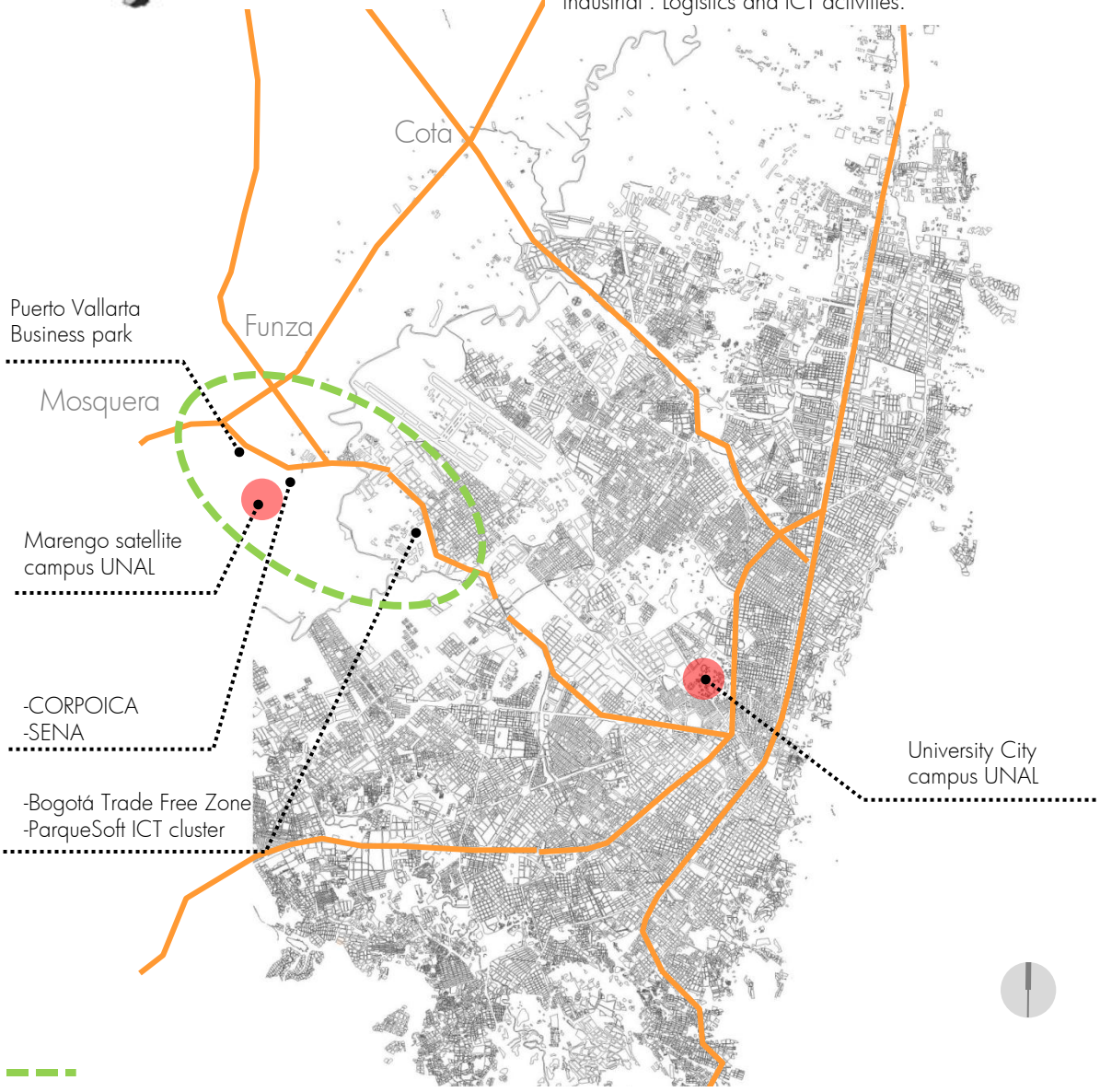


Figure 61 First development ring of the "Agro-industrial Megaproject of Bogotá and Cundinamarca" which includes the campus satellite of Marengo where the Agricultural and technological hub" proposed between UNAL-CORPOICA-SENA is located. Source: Bogotá Chamber Commerce, 2006

- Department of Cundinamarca
- Bogotá metropolitan area
- Agro-industrial development ring
- Location Agricultural hub UNAL-CORPOICA-SENA

Figure 62. Location campus satellite of UNAL and the formation of a new geographic cluster involving Agro-industrial . Logistics and ICT activities.



Promotion of the Mosquera - Free Trade Node to conform the "**Tech-Park of Bogotá Savannah" ,** nowadays in feasibility study with an Agreement subscribed between the Ministry of Commerce, Industry & Tourism; the Colombia association of SME's; the Biomedical cluster Innovar; and the Free trade Zone

4.4.3 Real Estate planning and implementation analysis

This part of the analysis is aimed to define the measures through which the campus managers of the UCB define and implement their real estate decisions. Therefore an evaluation of this measures is done based on the preliminary inputs found through this analysis.

Description

In order to support the institutional Vision, the planning office has two intended strategies related with physical infrastructure. The first one is "Updating the campus" and has the objective of improve the spatial conditions according to specific academic needs within the same amount of square meters. The second one is "Campus extension" which supports the intended academic growth by building new square meters for research and academic space. Both strategies counts with specific interventions that follow the urban guidelines established in the Regularisation and Management Plan (PRM) as well as the regulated process determined by the Physical Space Policy.

Accordingly, the PRM is used as spatial model with guidelines for occupation, use of the land and urban integration required by district authorities in a form of policy. Likewise, this plan provides proposals such as the public space plan that has been implemented since 2005. Certainly, this instrument not only act as policy but planning instrument with integrated proposals for interventions at urban level. In contrast, interventions at portfolio and building level, which certainly are regulated through the Physical Space Policy, are emergent projects from different sources -faculties, institutes, offices- without an integral planning approved by the Advisory Committee of Physical Space – CAEF.

In view of this disconnection of the planning sources, the perception of these projects differs according to the stakeholders and thus, the priority for implementation is segregated. According to the Director of Projects of the UCB (see Appendix III) these projects are divided according to their scale level in two: (1) large scale projects that must be designed by external consultancy firms, which are three new buildings aimed to be architectural landmarks; and moderate and small projects that can be designed within the Projects Group of the Planning Office, which include six new buildings four renovations and one public space project. In contrast, for the Vice-Rector of the campus, the same projects are valuated by their potential in making strategic external alliances. Thus, this planning view highlights some projects inside the campus and add to the list other projects outside the UCB. On his own words, these are the potential projects in which the university can make strategic and specific alliances :

1. The Santa Rosa hospital: the university received in donation a hospital building few years ago. It needs large investments in financial terms but the return on this investment is measurable not only in financial terms but represents a benefit for the academy and the society in general. To make this project works, the university just acquired a new land besides this building in order to complete a project which is planned to be managed by specialized institutions from outside.

2. Sport and cultural park and facilities: this project retakes an idea of Leopold Rother (architect who design the campus) to build in the west border an area which exclusively use will be sport. To make this happen the project includes the renovation of the existent Stadium "Alfonso Lopez" which is the second stadium in Bogotá and the construction of a new building that includes Olympic pools, gym and other sport fields. This project includes a large area of public space and sport fields which construction had already began.
3. Tech-park: is a long term project to build up a satellite campus for research. It will be located in Marengo, the current satellite campus outside Bogotá urban area.
4. Innovation ring Bogotá: is a project that involves an important area of the city where main business, corporate parks, tech-parks, the airport and the National Administrative Centre (CAN) is located. For instance, the strategic location of the University in this project represents an excellent opportunity to make alliances with other important institutions.
5. Health City project in La Hortua: is another important area for urban renovation in which thee Municipality is interested and the University possesses property that can be used with academic purposes as well as for society benefit like the San Juan de Dios Hospital.

These two views, has permitted to identify two aspects in which the UCB campus planning is based. First, both perspectives give a priority to the projects that will increase distinctiveness of the institution. Second, the last perspective, involves the orientation of interventions towards the projects whit opportunities to find financial support from external parties. Nevertheless, the priority to develop physical projects is not integrated in any plan or implementation strategy. In fact, the priority given to the distinctive value of a project is conditioned by the financial support of the faculties and institutional funding.

Indeed, the Institutional and Territory Planning Office has list of 23 projects (Appendix V) which priority for execution is based on the measure of following four qualitative parameters:

•*Use of the project:* it gives priority to the projects that will have a common use rather than the projects that will be used only by a single Faculty. Therefore, the measure assigns 2 points or 1 point respectively.

•*Community impact of campus improvement*: it gives priority to the projects that have a positive impact in the community. Thus, it uses an ordinal scale where 5 is very good; 4 is good; 3 is moderate; 2 is non impact; and 1 is poor.

•*Construction progress*: it gives priority to the level of its development. It means, as higher the percentage of development of the project, higher the opportunities to execute it. The level of development

•*Construction costs*: based on the total construction costs range, which vary from €1.2 up to €11.0 millions, a value is assigned by using an ordinal scale from 5 to 1 departing from the mean of the constructions costs as is illustrated in Figure 63.

Figure 63. Measurement scale for "Construction costs" as parameter for project prioritisation. Source: Institutional Planning office, UNAL - Bogotá, 2010

0	>€11.0	
1	€10.4-€10.0	
2	€9.6-€8.5	
3	€9.2-€7.6	
4	€8.0-€7.2	
5	€6.8-€6.0	mean
4	€5.6-€4.8	
3	€4.4-€4.0	
2	€3.6-€2.8	
1	€2.4-€1.6	
0	<€1.2	

Note: costs in € millions converted from Colombian pesos at today's exchange currencies

Therefore, the previous parameter gives priority to the projects with average construction costs among them. For instance, large or small scale projects are not benefitted in the range used in this assessment.

Based on this last overview, the sum of the scores given by each parameters results in a separate grade for each project. For instance, the sum of points defines the priority of the project. Nonetheless, the feasibility of their execution depends on the available budget. According to information detailed in the Appendix V, 10 projects has a high impact on the community, the other 13 has an impact only at faculty level. Similarly, 12 of 23 projects are for common use or inter-faculty projects. The construction costs varies according to the projects with a construction costs mean of €6.0 millions; 7 of the total number of projects are considered large scale projects which construction costs overcome €6.0 millions. Nevertheless, only 7 projects are feasible according o the budget available which is €57.7 millions in total, from which €40.3 millions are covered by a loan (70% of the total costs). The 7 projects approved within the available budget are distributed in 30.000 m2 of public space; the new laboratory building (anchor project); renovation of 3 landmark buildings from which two are national monuments and 1 is a new building. The rest of the projects in the list are distributed in this way: 3 new medium-size buildings inside the campus; 4 physical projects supporting research activities; 1 renovation of landmark building; 4 renovation projects outside campus (2 located in the city centre and 2 in rural area); a large project of public space well-known as the Sports park; canteens and restaurants master plan; and 2 infrastructure projects related with improvement of the fence.

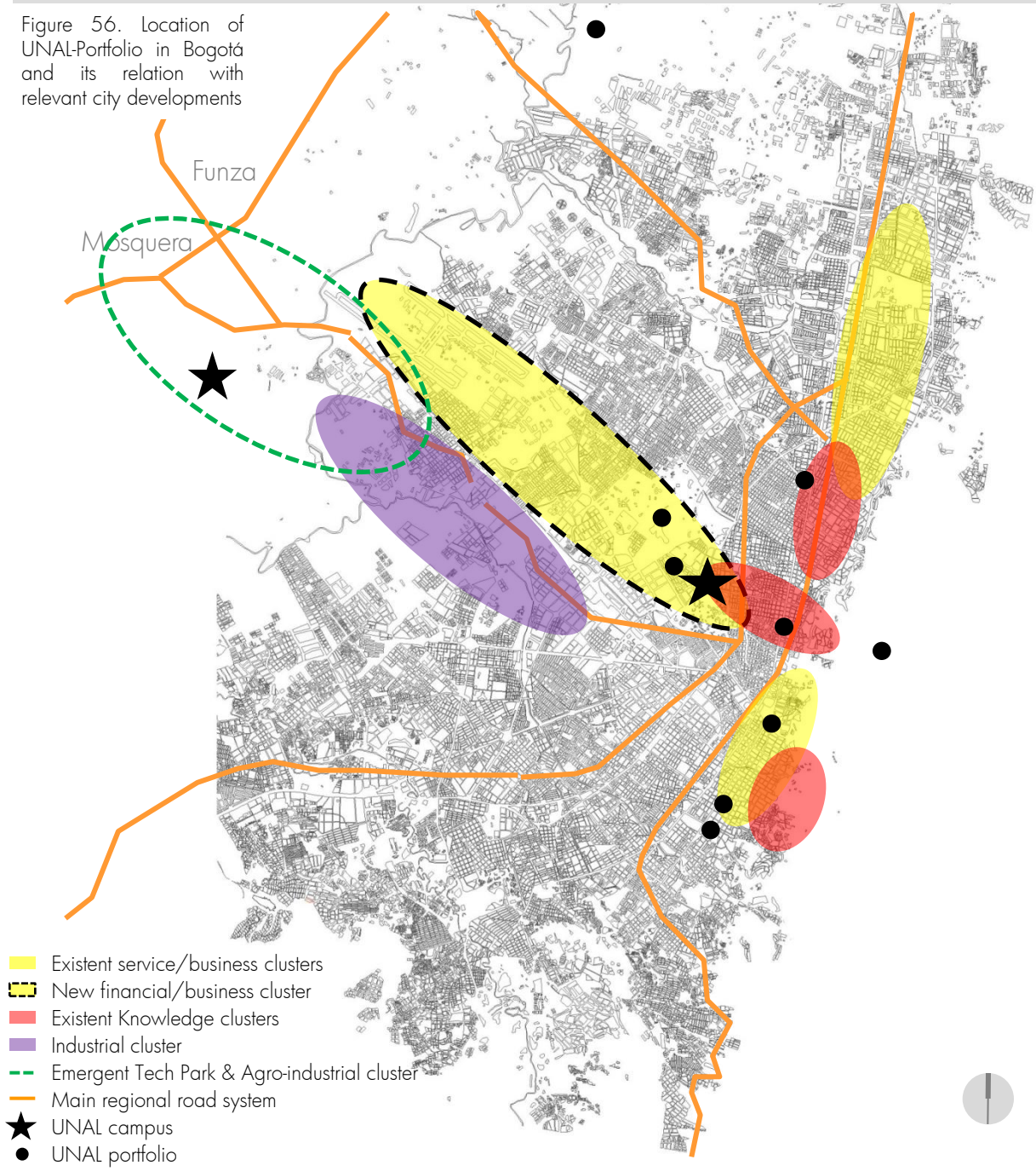
It is noticed that only two projects in this list are related with the five strategic projects mentioned by the Vice-Rector and counts with own resources for execution; the *Sports park* and the project in *Marengo Satellite campus*, which certainly is related with the development of a tech park but which intervention is not specified. In this context, it is highlighted the construction of the Sports park, which is the largest project with participation of third parties and external investment. This project include the construction of an Aquatic Complex with three semi-Olympic pools; the renovation of the Alfonso Lopez Stadium, which a current capacity of 10.000 places will be enlarged up to 18.000 places; 9 soccer fields; and a roller-skating field. Besides, the area will counts with a 2000 m2 building for a Sport-gym and other indoor sportive activities. For its execution, which will costs around €12 millions, counts with private financial support from CAFAM, which is a family compensation fund. The architectural and complementary designs will be provided by the university and are almost complete (Figure64). This project is a relevant example of university-city collaboration through the optimisation of campus physical resources, in which the university community is directly benefitted, as well as residents of the sector and external users that will be attracted by the services offered in the area. Indeed, this project is the best reference of urban integration carried out for the university since its foundation.

Figure64. Design Sports park porject within the University City Campus. Source: El tiempo newspaper, June 2008

Likewise, there are two projects within the existent list of feasible projects that has been identified as relevant at area development level: the Inter-faculties laboratory building and 30.000m2 of public space which potential for urban integration must be exploited and optimised as well to obtain financial support. In the same manner, there are some other projects that can be triggered by financial opportunities outside as well as other projects that according to the future developments in the area should be reconsidered.

Therefore, there is need to integrate a vision of the portfolio -in line with the institutional vision- in a single strategic plan which take into account the future developments at area and city levels in order to optimise the use of the portfolio and the potential of its location (See Figure 65)

Figure 56. Location of UNAL-Portfolio in Bogotá and its relation with relevant city developments



In this regard, three cases from practice can be used as references, in which campus strategy and urban context can be approached in different manners. The source of this references was found through literature review on the study "Global Universities and urban development: case studies and analysis" (Wiewel, W. and Perry, D., 2008)

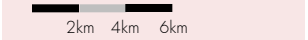
The first case is the Accommodation strategy of the University of Helsinki, drawn up in the university's development plan 1992-2010 that introduced the idea of four university campuses in the following urban areas and specialised in different disciplines: city centre (Social and Human sciences), Kumpula (Natural sciences), Viikki (Forestry and agriultural sciences) and Meilahti (Medicine). In this case, long term planning was used as a management tool to align university plans with a long term city vision. Accordingly, University's real estate department worked with city planners to develop Helsinki. In the 1990's the city adopted a new strategy: to develop Helsinki as an innovative city based on science and research. The Trade and Industrial Policy program in 1998 introduced seven clusters: biotechnology, food, information, culture, tourism, health care, and the environment. Three projects were developed to implement the clusters: Viikki Science park; Biomedicum; and Art & Design City Helsinki. It is highlighted that the two former clusters were located inside the campuses of the University of Helsinki. Therefore the decentralisation of the university in different campuses impulse the creation and allocation of economic clusters according with the city plans.
The decision to decentralise its faculties among the four campuses was important for the university as well as the city. One issue for the university is how faculties and departments on different campuses can best communicate with each other and how to make sure that the institution as a whole benefits from being a multidisciplinary university. To connect its various campuses and also the other universities in the Helsinki metropolitan region, the University of Helsinki and others universities created a public transportation plan called the Science Way (relevant initiative). The university acts not only as developer, city builder but traffic planner. Then the Science way is connecting the centres of expertise in Helsinki metropolitan region, supporting the networking of universities and firms, and facilitating flexible learning as per decisions of the City Council in 2002.

Another remarkable aspect to outline, is the establishment of a partnership between University, State and City which produced a new type of suburban private and smart campus space in Viikki during the 1990's. Therefore in this science park the university and the city established a limited liability company (Helsingin Tiedepuiston Asunnot Oy) to provide rental housing for the staff working in the science park. This provisional housing has had a positive effect on the whole campus neighborhood and prevented the negative external effects universities might have in neighborhoods. Indeed, this initiative can be a useful reference to solve one of the problematic impacts of University City case at area level.

>> REFERENCE CASE

The decentralisation of the University of Helsinki into four campus triggered the development of the city and defined the allocation of economic clusters within the City developmental policies.

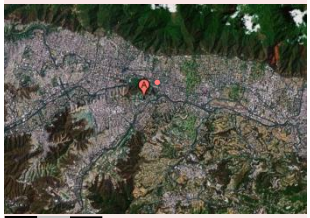
Location portfolio in the city and its region. Source: Google Earth 2010



>> REFERENCE CASE

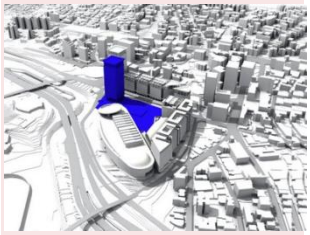
The development of the ZRPV Plaza Venezuela Rental Zone in the vicinity of the campus is one of the most important real estate development of the city with a double benefit for the university and the city. +info: zonarentalucv.com

Location Central University of Venezuela and its rental Zone in Caracas. Source: Google Earth 2010



Campus Central University and ZRPV

Proposal ZRPV development



Stage of development of ZRPV

The second reference is located in the Latin-American context and was selected as a relevant example form practice since it presents some similarities with the University City of Bogotá regarding the character of the institution and the conditions of its campus.

The Central University of Venezuela is the eldest, largest and most important public institution of this country. It campus was created in 1947 and is well known as the University City of Caracas – CUC. This campus share physical characteristics with the University City of Bogotá. It has a portfolio of 65 buildings, which modern master plan and symbolic architectonic buildings are included in the world Heritage List since 2000. The campus was drawn up as a Greenfield of more than 200 hectares, which nowadays are located in the heart of the city.

It is outlined the creation of the Plaza Venezuela Rental Zone (ZRPV), which is included in the original Master Plan of the CUC; that is an extra area of 10 hectares for real estate development that would generate resources to financially support the scientific activities carried out by the UCV. In 1974 the government created the Andres Bello foundation for the scientific development of the Central University of Venezuela which is aimed at developing the ZRPV into a great city-scale business, commercial and recreational centre. Accordingly, the ZRPV is a large scale project located in the heart of the metropolitan area of Caracas, in the vicinity of the CUC, that will have a positive impact on the urban development of the city, not only because of the foreseen total investments and urban dynamics that will arise as a result of the mixture of uses, but also because of the quality of the buildings and urban spaces that will be built. Thus, project is unique because:

•The ZRPV consist in land granted by the state to the UCV for the development of a real estate venture

•The real estate development of the ZRPV is controlled by a public body; a separate and autonomous foundation which operation has not conflict with university mission.

•The Foundation aimed to develop the area is a non-profit corporation whose real estate strategy is based on its association with private investors. In fact, the foundation is able to carry out any type of business, except for land selling. Thus, The foundation remains the owner of the land and the investors are given usufruct rights which allow them to commercially develop and exploit a land plot at their own expense, paying a fixed rent during the usufruct period (30-60 years). When the contract expires, the improvements made to the rented lands revert to the foundation.

•All profits produced by real estate development of the ZRPV (once operating costs have been deducted) are to be transferred to the UCV for its scientific development.

Therefore, the foundation has given priority to the appreciation of its economic value through real estate development o the land. Due to its autonomous management, the decisions on real estate or financial matters concerning the development of the rental zone are neither related to nor shall be they affected by the UCV's institutional interests.

4.5 Conclusions Analysis: Campus Managers and their competences solving the UCB problems

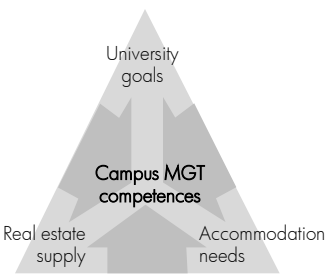
In order to recognise the competences of internal stakeholders facing accommodation needs, it is necessary –after this extent analysis- to redefine the real estate problems that the UCB is confronting as well as positioning the stakeholders' competences solving these problems. For that purpose, three independent variables are used as basis for problem solving analysis which are unique in every case: University goals, University real estate supply and University accommodation needs (see Figure66). In the case of the University City, these three variables, which are described as follows, have positioned the current problems of the institution according to their respective campus management fields and their delegated groups or individuals in charge. For instance, the management areas to improve -and their respective actors- could be easily identified in order to orientate a real estate strategy in line with the institutional vision.

Accordingly, the institutional goals are defined within the frame of UNAL Vision – 2017 at national level, which is the same for all the seven headquarters including the University City of Bogotá. Accordingly, the University musts strengthen its national character as public higher education institution; First, by maintaining the access to knowledge for all Colombian citizens. Second, by promoting the development of education & research. And third, maintaining the position of the university as the first in the national ranking and positioning as one of the most important of Latin-America and the Caribbean, with high quality of programmes, provided with modern infrastructure and flexible didactic techniques that facilitate a quick response to the changing demands in its environment and insertion in the global world.

Thus, the accommodation needs of the university are defined in the last few lines of the vision as a requirement to reach the institutional goals. For instance, the physical resources should be provided with modern infrastructure that guarantees the unforeseen demands in the global and local contexts of the higher education. Therefore, these demands are not only qualitative but quantitative since specific goals such as the development of education and research programmes -especially postgraduate programmes- brings an increase of the student population and therefore more space is required. In these way, the University vision appears as the linking element between the institutional goals and the academic needs which are aligned since there is a recognition of the importance of physical resources supporting higher institutional goals.

Finally, the current real estate supply counts with a multi-functional portfolio of more than 131 buildings of different scales, located in valuable urban land but outdated and aging. For instance, in order to support the institutional and accommodation demands the university needs to update its physical infrastructure. In view of that, there is a development plan which includes the strengthening of physical infrastructure as one of its programmes connecting campus supply with institutional demands supported as well by clear real estate policy.

Figure 66. Independent variables in order to position campus managers' competences solving real estate problems



However, the current physical infrastructure strategy is emergent and lacks of an specified plan of approach with an integral long term vision at portfolio level which constitutes the first problem. As a result, there is an ambitious list of separate projects, which certainly have emerged according to accommodation demands and institutional vision, that require large investments not covered by the university budget. This lack of financial resources, which is the result of an increase of physical interventions during the last three institutional periods, is the second real estate problem the stakeholders need to face.

Moreover, the combined approach of this analysis, in which campus as real estate object is positioned between the portfolio and area level, has brought external variables that should be considered by campus managers for the orientations of its real estate strategy. Accordingly, universities has to develop consistently, adapting their Institutional, accommodation and real estate supply orientation to the requirements of wide city visions and policies, urban strategies and area developments respectively. Therefore, the involvement of these external aspects in campus management cannot be avoided. On the contrary, they could be a source to provide solutions to the current campus problems.

➔

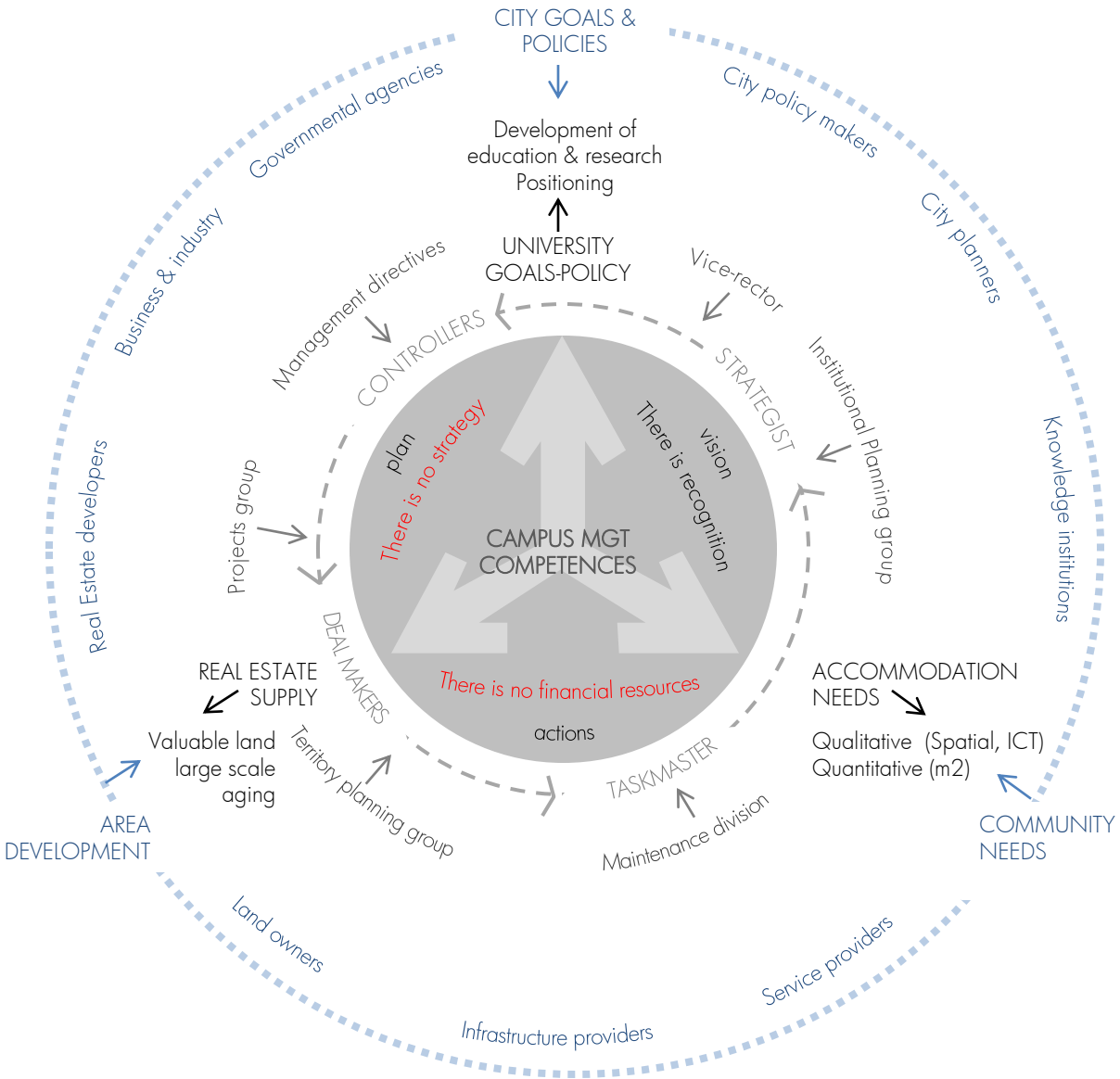
In synthesis, the participation of the internal stakeholders of the University City case is positioned around the three independent variables that define campus real estate problems and campus management competences and illustrated in Figure 67. According to this Figure, in the case of the University City, the shift of the real estate management role from *operational* to *strategic* –addressed by many authors in CREM theory- is cyclical and complementary according to the three independent variables defined before. This cycle could have different starting points but always a direction in which the actions follow a plan which also follows a vision connecting the three independent variables. In these sense, the campus management competences change according to this logic and direction. Since there is a clear division of roles, every one supports each others management competences but facing the campus problems in different manners. For instance, we can conclude that the University City of Bogotá, after many years of being managing its real estate at operational level, has intended to shift radically to an "strategic level" without a continuous or evolutionary process that have brought difficulties solving campus problems since there is a lack of knowledge and experience of real estate management supporting institutional goals.

Therefore, is spite of the physical infrastructure has been recognised as a primary element to reach the institutional goals and is part of its general vision, the university needs more than visionaries to carry out this goal. Since there is a problem of means (lack of integrated strategy and financial resources illustrated in red colour in Figure 67) campus controllers, dealmakers and taskmasters need to collaborate among them in order to support strategists' competences.

All in all, the University City has started a shift by recognising the real estate role as mean to achieve institutional performance. For that purpose, knowledge and experience in some management competences are required in order to deal with their problems which are not limited to internal aspects.

Therefore, the combined analysis developed along this chapter could be summarised in this model below, where the internal and external aspects required to improve campus management for the University City case are contextualised with its problems and stakeholders involved. Therefore, the orientation of a real estate strategy should be based in the interrelation of these three variables, which are specific for each case, where type of organisation, accommodation needs and real estate supply differs according to its socio-economic and urban context.

Figure67. Positioning the campus management competences and stakeholders involved according to university real estate problems of the University City of Bogotá.



4.6 Strengths and weaknesses of the University City's in order to improve its campus management

An overview of the findings of the analysis carried out on the pilot case study and the review of case references is gathered in Table 3 with the aim to answer the two latest sub-questions of this research that will be the basis of the synthesis phase as well as to orientate of the main output of this research.

Table3. Overview of analysis on Pilot case study.

		STRENGHTS	WEAKNESSSES
Input: Strategy basis	INSTITUTION "UNAL"	Best Quality of knowledge base in the national context (academic and research activities)	Weak and young relationship with industry
		Largest incubator of knowledge workers	Little collaboration with other HEI's in Bogota
		Large amount of extension activities involving students and teachers in different disciplines	Little support students accommodation
		Strong collaboration with other HEI's at national level	Lack of concern with the quality of life ot the neighbour community
		University vision is aligned with higher policies focused on knowledge economy	Weak level of interaction between the university and firms within the clusters
		Supply of varied academic and research programs related with strategic economic sectors	
Object research	REAL ESTATE SUPPLY "THE UNIVERSITY CITY"	Valuable land in A Location attracting stakeholders and related with the development of geographic clusters	Aged portfolio
		presence of Heritage buildings relevant for collective memory of the city and the country	No relationship with surroundings
		presence of cultural and sport facilities for use of citizens	Isolated and gated condition due to Security and safety demands
		Great connectivity and accessibility	
		Relevant for environmental structure of the city	
Output: Strategy focus	REAL ESTATE STEERING PROCESS "CAMPUS MGT"	High commitment with UNAL vision	Conservative attitudes of bureaucracy models to exploit the available resources
		Availability of information	Little knowledge on REM
		Well organised structure and delegation of functions	Lack of monitoring of technical conditions of buildings
		Availability of professionals and knowledge workers	Lack of better communication channels between internal stakeholders
		Availability of real estate policy at urban and portfolio levels	Inefficient use of human resource
			Delay of decision, long process
			Inefficient allocation resources
			Limited time of plans tied to administrative periods
			Vague implementation plan
			Segregated priority for implementation of projects

How the campus is managed in the University City and what areas need to be improved?

According to the summary of the analysis above, the management of the University City is organised in a centralised structure trough a clear delegation of functions supporting the general management in the head of the Vice-rector. Certainly, during the last three administrative periods, the campus managers has put a lot of attention in the quality of the physical infrastructure supporting institutional goals, as a result of internal and external demands in the context of the higher education. As a result, diagnosis and studies carried out for the institution has provided a large amount of data that has been used to develop policies and establish bodies in charge of the physical development of the campus.

Nowadays, campus managers are aware of the relevance of the physical resources supporting institutional visions, and either of their strategic situation in the urban context. Therefore, an increasing list of projects has been developed during the last years that has represents a growth in investments that are not covered by their budgets and now they are looking for new sources for finance their projects. However, in order to achieve their goals a redefinition of their plans is need it. For instance these are areas to improve identified along the analysis:

- Efficiency of allocation of physical and financial resources available
- Effective use of the available knowledge and human resources
- Simplification of processes and delegation of functions

Which management tools could be transferred from best practices as references to improve campus MGT in the UCB?

There is a limited number of reference case studies from practice found it trough literature review. Nevertheless, the management tools provided for this review of cases studies is large and are presented in different "soft" forms such as initiatives or specific actions. Moreover, most of them are aimed to strength the collaboration between higher education institutions and external parties either as provider of knowledge or physical resources. Thus, the usage of this instruments and references are strongly related with their contexts and their interpretation must be used carefully. Among others, the following are highlighted as initiatives to attract external support as source of financial means:

•Setting up of extension services through which the universities could work with the community in the are they are located by providing knowledge solving their current problems.

•Participation in upgrading of urban areas in their vicinities.

•Establishing chairs or professorships in relevant fields for the local economy

•Offering high quality of research facilities

•Setting up transfer agencies to establish links with business sectors.

•Participating in cities' economic development boards or concerted rooms in the city and region.

•Enhancing support of students needs trough the setting up Students Unions concerned with students housing accommodation and services.

5 Chapter five
Strategic plan for the UCB

How can the University City of Bogotá improve the management of its campus as a real estate object in order to support their institutional goals ?

The campus managers of the University City has put large efforts to orientate its physical development according to the current institutional long term Vision during the three last consecutive periods of its administration. As a result, the university counts nowadays with a real estate policy that regulates the interventions on campus and the occupation of its land as well as a general plan focused on spatial urban proposals. Nevertheless, the results of the analysis on this pilot case study has revealed specific areas to improve regarding its physical management. Certainly, this is an ambitious goal since real estate management is a complex discipline that in the case of large scale campuses involves: First, the institutional goals related with many internal and external stakeholders. Second, the current conditions of the real estate supply related with the internal accommodation needs and urban demands. And third, the know-how on steering real estate decision by linking all these mentioned elements.

In this context, this chapter will provide an answer to the main question of this research through the development of an "Strategic Plan" with the aim to provide a better structure on their vision and providing new opportunities for campus development supporting institutional goals. In this way, the so-called "*Strategic campus management plan for the University City of Bogotá*" will provide a solution for the current problems of the campus –starting point of this research- and at the same time it will test the basic assumption that the real estate management of higher education institutions with large scale campus is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies' orientation.

5.1 Strategic campus management plan for the University City of Bogotá

Definition
The strategic campus management plan for the University City of Bogotá is a real estate management plan for accommodation and investment decisions on its physical resources.

Mission
Improve the current management of the university city campus in order to: (1) Support the Institutional long term vision (UNAL Vision 2017) focused on distinctiveness and productivity of learning and work environment; (2) Solve the current problems of means -related with the lack of financial results and the lack of knowledge on real estate supporting institutional performance- and; (3) Prevent future qualitative and quantitative mismatches resulted from the dynamic demands influencing the spatial development of campuses in the context of the knowledge economy

Stakeholders interested
This strategy is aimed to campus managers, specially to Asset, Facility and Maintenance managers of the University City which together must support the institutional goals envisioned by the General Manager. Likewise, the orientation of this strategic plan involve the participation of external stakeholders, who depending in the level of involvement on specific action lines will be interested in the success of this strategy, which certainly will benefit the society as a whole due to the public character of this institution.

Orientation with university's vision
According to the UNAL-Vision 2017, the University wants to strengths its national character as public higher education institution; first, by maintaining the access to knowledge for all Colombian citizens; second, by promoting the development of education & research; and third, maintaining the position of the university as the first in the national ranking and positioning as one of the most important of Latin-America and the Caribbean. Therefore, this strategic plan will provide a supportive mean to achieve these mentioned institutional goals through the efficient and effective management of campus physical resources by focusing on:
- Strengthening the distinctive image of the University City campus as a relevant icon for the society in the urban and national context.
-Improving the quality of the physical infrastructure supporting the productivity of academic and research activities and the fulfillment of university's functions.
-Highlighting the relevant role of the UNAL as a node in an emergent collaborative network in the context of the knowledge economy in Bogotá.

Goals

In this context, the Strategic Campus Management plan of the University City of Bogotá sets out a comprehensive set of long term objectives driven by three action lines:

A. Enhancing distinctiveness and prestige:
- Strength institutional image
- Attract students and staff
- Promote sense of belonging in university community and society

B. Supporting university's function
- Stimulate innovation and research
- Increase productivity of academic and working activities
- Support the access to knowledge
- Attract partners in process for research collaboration

C. Stimulating social integration
- Stimulate university-city cooperation
- Support cultural-sport-leisure complementary activities to increase the quality of life of the community
- Attract external users
- Attract partners in location for infrastructure collaboration

➔

Concept of "Integration"

In order to remain successful in the context of the knowledge economy, some changes in culture are needed. Universities, specially public ones, need to abandon the traditional conservative positions led by the idea of "autonomy", which has been misunderstood as "isolation". The condition of being autonomous or independent has sense when a community is self-governed in every sense. In the case of public universities, this condition will be threaten if they are not able to remain self-financed on their owns, since the large investments required for the fulfilment of their functions are not covered by their budgets and the financial support from the government is diminishing. Thus, in order to remain autonomous, public universities must look for integration rather than isolation.

The concept of "integration" refers to the process of fitting into a community. In fact, changes in social, economic and urban structures has put pressures and nowadays the National University of Colombia has recognised its leadership position in the academic and social context by strengthening the quality of their research activities and leading initiatives and programs to strength its relationships with business and industry sectors.

In this context, the role of the physical infrastructure supporting this vision cannot be relegated. The campus must reflect the changing culture of the institution towards external collaboration which at the same time could be a source to solve the internal problems of means faced by the institution, that are in fact, a threat for the fulfilment of its functions, the achievement of their goals, and therefore for its institutional autonomy. In this frame, the concept of "integration" appears to support the ideas of distinctiveness and productivity in a collaborative network, which are the three orientation lines of this strategic plan trough which real estate decisions at different levels are made and described as follows.

5.2 Guidelines for real estate accommodation and investment decisions

The decision contained in the Strategic Campus Management Plan of the UCB, are real estate decisions which will orientate the allocation of (1) physical resources for accommodation and (2) financial resources for investments. Therefore, in order to structure the set of actions in line with the conceptual approach of this research, they are distinguishes as actions at *portfolio* and *area* level. For instance, the first level involves the campus decisions, driven by institutional demands which development has a little or non impact in the UCB's urban context. Therefore, the set of actions at portfolio level correspond to Lines of action A and B, which demands are driven by internal goals and needs. In contrast, the second level involves the campus decisions, driven by complementary institutional and urban demands which development has a certain impact at area or even city level. Therefore, this second set of actions which are included in Line C, are aimed to test the basic assumption of this research. Accordingly, the set of specific actions will be presented according to the three orientation lines of this Strategic Plan.

Action Line A.
Enhancing distinctiveness and prestige: ***The White City into Green***

Certainly this line is driven by the perceived image of the campus for users and for the society as a whole. Therefore, the set of actions described as follows will permitted to integrate the internal and external perception of the campus into a single symbolic image and for that reason, the motto of this line is "*the White City into the Green*" which highlights the two most symbolic elements of the collective memory on the campus. First, the White City was the name given to the first phase of the University City (1937-1944), which corresponds to a group of buildings characteristic of the Modern Movement. Most of the heritage buildings of the campus belong to this period and are representative of this architectural style in the country. Since then, the white language of the buildings became the emblematic image of the portfolio until these days (Figure5.1). Second, the "Green" refers to the value of the large green areas of the campus in heart of the city. Indeed, the campus is considered as a green lung and the preservation of the Greenfield campus-type has a strong environmental value for the city. In this context, this line will consider the actions aimed to strength this integrated image. The following actions will take place at portfolio level with and indirect impact at area level:

Figure 5.1. Predominant building language in the UCB

A.1. Upgrading the existent portfolio

This action is aimed to improve the image of the portfolio as a whole by making three type of interventions in the existent buildings according to specific needs: consolidation, renewal and disposal. For that purpose, the allocation of interventions and investments should considered a prioritisation of buildings. According to the portfolio analysis the priority is given to the buildings that allocate relevant functions such as academic, research, administrative and facilities.

Hence, the selected relevant-use buildings are categorised by their perceived image in 3 groups. For instance, the buildings which image is representative such as Landmarks, heritage buildings are the first prior group for investment which, according to data provided by the portfolio analysis (Appendix IV), are 62 buildings. Indeed, for this prior group the disposal is not considered. According to their conservation status, 5 buildings are new ones and needs consolidation through regular monitoring and maintenance; 26 buildings needs renovations such as simple reparations (19 buildings) and several reparations (7 buildings); 29 buildings declared National Monument and Estates of Cultural interests needs a continuous monitoring and maintenance system and most of them needs renovation to adapt the academic functions to the new space demands. For that purpose and because their treatment is especial, the interventions of this group of buildings should be part of a Special Maintenance Programme that must be led by the Planning Office at headquarters level in cooperation with the Ministry of Culture and therefore, applied and financed by the respective faculties in charge of their properties. Since, the service required is specialised the execution of these interventions on heritage buildings should be outsourced.

The second group correspond to 36 buildings which were graded as non relevant perceived image. Accordingly, 11 of them needs renovation and improvement of image; 6 of them are welfare services type (snack bars) which interventions is currently part of a separate Master plan; and 19 buildings should be disposed in the long terms since their technical conditions are poor and their spatial flexibility is not relevant to considered renovation works. Certainly, these are 14,789 m2 of academic, research and administrative spaces that need to be replaced somewhere else.

Finally, the third group refers to 17 buildings which allocate relevant functions but all of them has a bad perceived image. Therefore, all of them must be disposed of the portfolio in this way; 3 buildings which area together is less than 65m2 need to be replaced in the same location since they are fixed services (caretakers' rooms); 7 buildings (5.577m2) must be disposed in the short term; and 7 buildings (1.659m2) must be disposed on the mid-term. In this context, more than 7.000m2 must be relocated which high impacts in terms of spatial and investments needs are addressed at the end of this chapter.

All in all, it is outlined the treatment for the buildings used by other institutions in the first and the second group, which image is relevant for the campus but which interventions must be integrated with University vision in a separate plan lead it by their respective facility managers under the supervision of the UCB planning office.

Figure 5.2. Quantitative impact of Upgrading the image portfolio according to the type of interventions

	High ← GROUP PRIORITY → Low			
INTERVENTION	Total	Relevant Image	Non-relevant Image	Poor Image
Special treatment	75.597m2	75.597m2	–	–
Consolidation	25.869m2	25.869m2	–	–
Renewal	218.379m2	169.063m2	49.316m2	–
Disposal	12.089m2	–	4.789m2	7.300m2

A.2. Expansion of portfolio

This action is aimed to orientate the quality of the future supply of in the University City (including new buildings and renovations) in line with the standards required to fulfil the academic functions and enhance the desired image. In this sense, the expansion of the portfolio must follows not only the guidelines of the land occupation plan proposed in the PRM but a set of qualitative considerations at project level. Certainly, the environmental and technical requirements for projects regulated through the Physical Space Policy, must be integrated into specific requirements aimed to promote green and sustainable solutions that will enhance the desired portfolio image "*the white city into green*".

The university should opt for high performance buildings, which sustainable design and construction of both new and refurbished buildings not only will strength the campus image but can minimise negative impacts through, for example, more efficient use of energy and water, or the utilisation of renewable energy and materials.

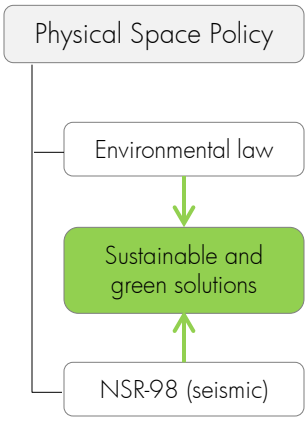
All universities will eventually do this, driven by a mix of rising energy costs, tightening regulations and changing stakeholder expectations. Indeed, this is a long term vision which large investment now will be rewarded in future. In this sense, campus managers must evaluated options against the scenarios that are likely to apply in 20 or 30 years time and their impacts in the whole life costs, instead of focusing primarily on the immediate concerns of capital cost or standards design of buildings against today's norms. They should also pay greater attention to the implementation of designs which benefits are actually achieved in practice.

In this context, high performance in buildings should be used (1) to assess designs and construction of new buildings and renewals and (2) to assess the performance of the building when decisions about replacement and renewal are considered. Therefore, a guideline of measurement parameters should be integral part of the current Physical Space Policy (Figure5.3), and should synthesise all aspects of how a building functions, including aspects usually associated with 'green issues' and 'sustainability' which are achieved for example, by using:

- Structures and layouts that deliver highly productive and adaptable working conditions;
- Practices and materials that are designed to safeguard occupants' health and well being;
- Very low energy solutions and low carbon resource inputs;
- Low water consumption systems; and
- Effective use of scarce material resources [1]

Decisions about new or major renovations of existing buildings are some of the biggest to be made within the higher education sector. Their capital impact is obvious, but even greater is the significance of stream of their operating costs and, above all, their impact on people. Good physical environments can facilitate high quality learning experiences and research, and improve productivity and attendance. They can also be attractive to prospective employees and students, who increasingly seek out universities whose values reflect their own, and in whom they can take pride.

Figure 5.3. Integration of sustainable solutions in the Physical Space Policy to complement standards required for portfolio expansion



[1] High Performance Buildings, the Business Case for Universities and Colleges, March 2008, HEEPI and SUST - The Lighthouse on Sustainability .

This action line is driven by the utility function of the portfolio and is aimed to increase the efficient use of the physical resources according to future and dynamic spatial demands in the context of the higher education. In this sense, the buildings of the University City can not be seen only as a container for knowledge but an integral part of knowledge. Thus, the set of actions explained as follows, will integrate current plans that are already taking place in the campus with new concepts aimed to support the development of intellectual and research activities. Despite these actions are focused on portfolio decisions, they have an indirect impact at area level, since the improvement of the research and academic facilities is a source to attract users from other HEI's and research institutes as partners in process within the knowledge collaborative network, leading to knowledge integration.

B.1 Upgrading ICT infrastructure and Innovative space in buildings

This action is aimed to provided a modern infrastructure that facilitates a quick response to the changing demands of working and learning environments related with ICT developments and innovative workplaces and learning processes.

Currently, the upgrade of internal spaces in the campus takes place in an emergent manner according to the needs of faculties and institutes. As a result, in 2005 after the approval of the PRM, the Institutional and territory planning office delegated a group of architects and designers who develop a so-called "Buildings Intervention Manual" which tried to give the parameters and guidelines for punctual interventions in buildings with the aim to unify the procedures and results of these interventions. It does so, by defining standards spatial solutions based in specified furniture, constructions systems and materials Accordingly, this instrument fulfils its main purpose and had success during the first years of implementation. Nevertheless, the changes in spatial needs driven by innovative learning procedures and working environments has put pressure and nowadays this manual has becoming limited and obsolete. Besides, one of the main pitfalls was the misuse of the manual as a result of self-interpretation assigned per each users and the diversity and complexity of some intervention where the use of the manual was not suitable.

In this context, upgrading ICT infrastructure and Innovative space in buildings must be a priority when considering renovation of academic and administrative spaces according to specific needs which vary from one to another faculty and cannot be integrated in a single instrument such as a manual. In this sense, each faculty must define their own Spatial Plan according to their specific current and future spatial demands, but in order to attain this action, which is primary for the development of research and education, the Planning Office must put pressure to the faculties, which Spatial Plan integrating the upgrade of ICT infrastructure and innovative space must be demanded as requirement within the Physical Space Policy and integrated with the action "A:1 Upgrading the portfolio".

B.2 Optimisation of space

This action will complement the action B.2 as a result of dynamic use of the space and is aimed to control the expansion of the portfolio in two ways. First, through increasing flexibility of existent academic space and second, by proposing a multifunctional space for the use of different faculties.

In this way, not only internal integration is achieved through inter-faculties cooperation but actions A.1 and A.2 related with the expansion of the portfolio are balanced. It does so by avoiding past mistakes relating with the growth of the portfolio in the UCB, which has been characterised by the supply of additional required space per each faculty attending emergent quantitative demands without thinking of future or even considering to optimise the use of their current space. Accordingly, the UCB needs to balance its portfolio growth by optimising the existing available space instead still proposing new buildings that leads to increase the occupation of its land.

For that purpose, two punctual activities are need it. First, monitoring the frequency and occupancy rates of the buildings in order to identify how efficient the available space is used in both time and capacity. Indeed, the university counts with a Geographic Information System (SIG) that provides this information and has been the basis of the so-called "Auditoriums Master Plan" which is aimed to upgrade the quality of the large lecture rooms of the portfolio to be used for the different faculties (Figure 5.4). For instance, this master plan which started its implementation in 2007 must be strengthened by completing the remaining interventions and complementing its contents by involving also mid-sized lecture rooms and studios.

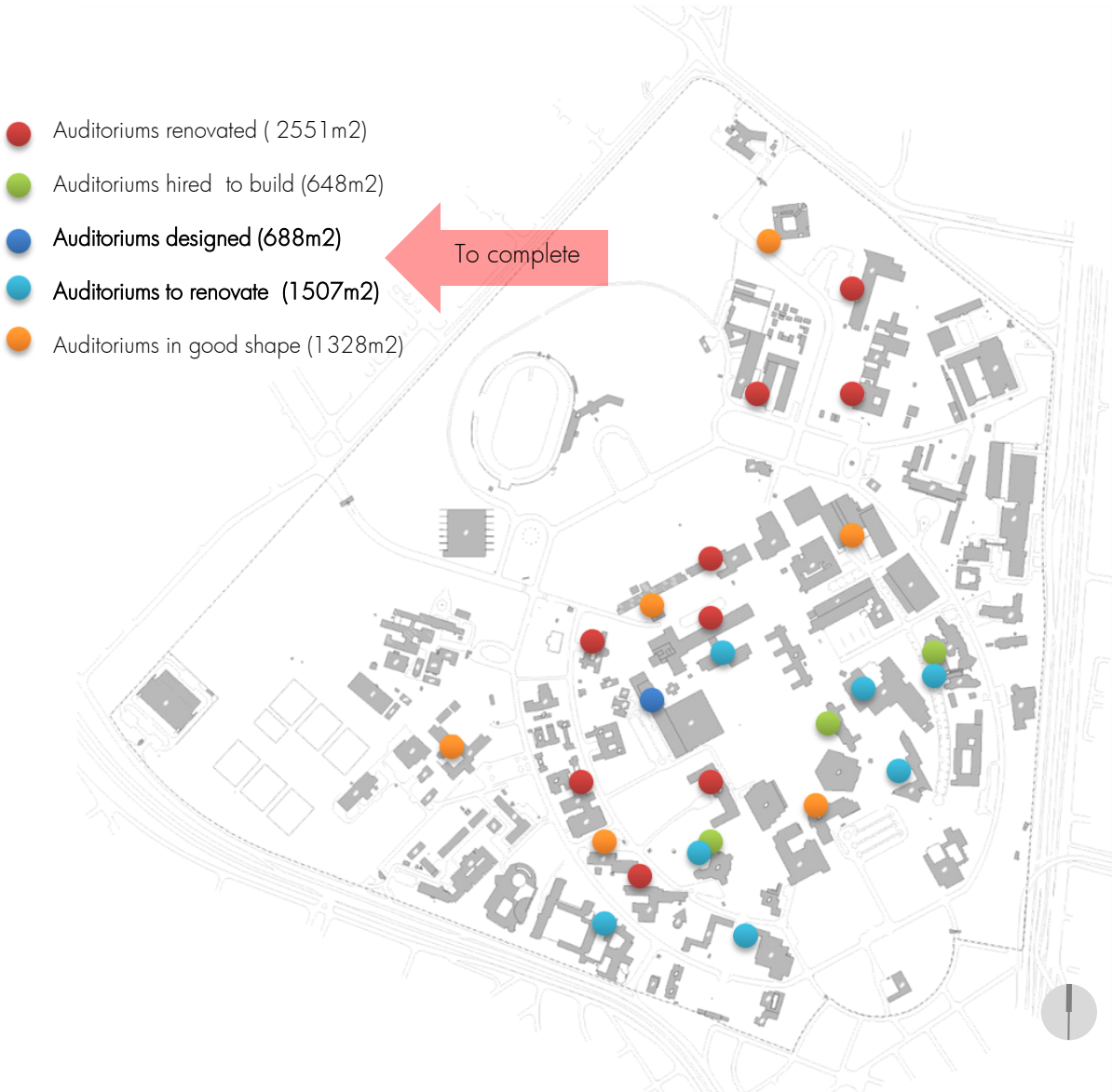
Second, prioritising the interventions of buildings that have a high degree of flexibility since they could be adapted for multifunctional use as well. Indeed, according to the portfolio analysis 63% of the buildings that fulfil academic and administrative functions have a flexible structure. Accordingly, this parameter its relevant when considering renewal or disposal of buildings.

B.3 Priority for research

The analysis of the context has revealed the important position of the National University of Colombia leading the development of research activities in Bogotá, through the presence of large amount of research programmes and groups and the initiatives to establish concerted rooms with governmental agencies and industry sectors. Therefore, in the context of the knowledge economy, the development and enhance of research activities is point of attention of local, regional and national policies. Such opportunity needs to be exploited not only by strengthening the supply of research programs but the physical infrastructure where these activities take place. Practical references has also demonstrate the relevance of research facilities in universities which use and resources can be shared among others HEI's and research institutions. Besides, inter-institutional cooperation is achieved in terms of knowledge and facility exchange.

In view of that, the allocation of physical and financial resources must give priority to the demands that involves the accommodation of research activities. Indeed, the current list of priority projects defined by the Planning office (Appendix V) must be re-evaluated according to this perspective. For instance, only one of the seven feasible projects of this list is aimed to enhance research activities. Nevertheless, this project so-called "Laboratories Building" is highlighted as one of the most important interventions in the University City since it will functions as an inter-faculties building allocating shared spaces for research and at the same time it is located in a favourable location for campus integration with an specific urban area development.

Figure 5.4. Interventions progress of the Auditoriums Master Plan. Source: Institutional and Territory Planning Office, 2009



This action line is driven by the matching demands of the institution and the city which certainly will have a direct impact at area and city level. This action has a basis in the evolution of the physical settlement of the campus which have defined a changing relationship with the city from introvert to extrovert. For instance, in view of the future and possible perspectives for HEI's in the context of the knowledge economy in Bogotá, which results in urban and socio-economic changes, the University City needs to re-define its relationship with the city, which nowadays is developing in the direction of an integrated city within the City (Figure 5.5)

In this context, and due to the large scale of the campus some interventions has a direct impact at area level that needs to integrate external demands as well. Thus, by integrating these external demands, the university will stimulates cooperation with external stakeholders and enhancing higher goals such as improving the quality of life of the citizens in general. Likewise, the implementation of this action line will serve to test the basic assumption that the real estate management of higher education institutions with large scale campus is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies' orientation.

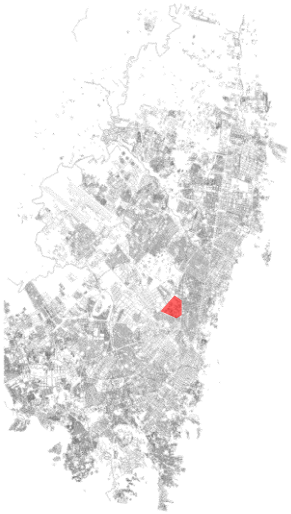
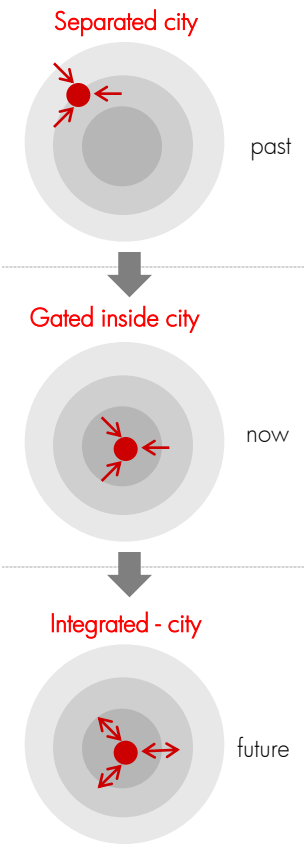


Figure 5.5. Evolution of the UCB campus's settlement



C1. Bringing the City to the campus

This action is oriented to promote projects of physical infrastructure that support the main functions of the university and at the same time attract external users. The recognition of the relevant position of the campus within the city's structure and the development of two potential areas rich of liveliness, mixed use and cultural activities in the vicinity of the campus, are opportunities that campus managers must exploit (Figure 5.6). In this context, the campus possesses two strengths for urban integration: the presence of relevant amenities in its central area and the availability of large open spaces (squares, paths and green zones) for the enjoyment of the citizens that actually could be used to connect the surroundings, which urban fabric has been interrupted with the presence of the campus. In fact, the actual gates of the campus and the presence of roads of prime hierarchy, are the main obstacle threatening the continuity of pedestrian flows.

In order to counterbalance this situation, the campus has initiated the construction of large scale projects of public space, focused on the main entrances and axis for connection which certainly has had a positive impact on the surroundings. Thus, this action is aimed to enhance the priority development of public space projects that first, integrate the existent amenities relevant for the area and second, are linked with urban mobility axis (Figure 5.7). Likewise, these projects must be complemented with the promotion of existent cultural activities and events inside the campus at city level and the development of new ones that certainly, will bring the city to the campus and improve the quality of life of the communities related.

Figure 5.6. Urban conditions to bring the city to the campus.

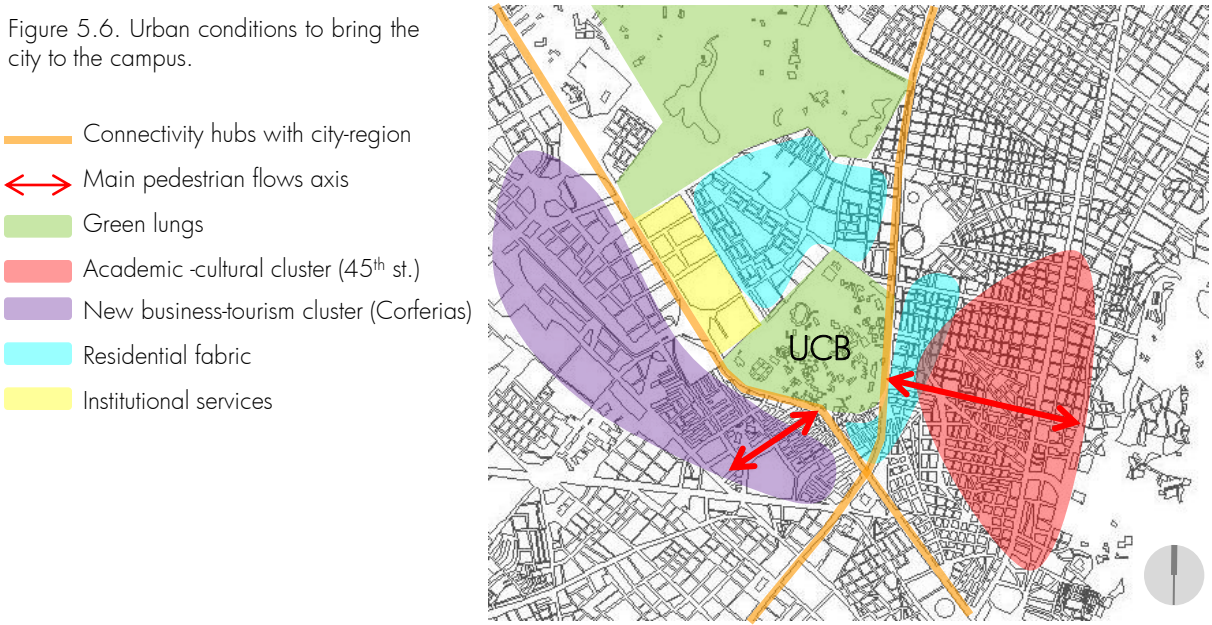


Figure 5.7. Location of priority projects to develop the action C.1 bringing the city to the campus

Poster University Week 2009
Source: Unimedios

	Relevant Area	Current Facilities	Current cultural activities
1	Sport-Leisure amenities	Alfonso Lopez Stadium Acoustic Hall Open Sport fields	National soccer matches Concerts - Sports championships Sports championships
2	Functional axis	None	None
3	Cultural-Leisure amenities	Leon de Greiff Auditorium Central Library Museum of Architecture Museum of Art Open Central square Open Cultural Park Chapel	Philharmonic Concerts - Conferences - University Book Fair - University week- Ibero-American Theater Festival None Art & design Exhibitions - Conferences Art Exhibitions - Conferences - Workshops University week- Opera at park- Concerts-Fairs -Ibero-American Theater Festival - Exhibitions-Fairs None

C2. Pushing the campus towards the city

This action bring together a series of relevant projects which development is aimed to open the university towards the city in order to strength its character as leader institution playing an active role in socio-political decisions for the city and the region. Accordingly, the university will achieve strong support from third parties interested in city-regional developments where the university and its real estate play an important part. With this in mind, and based in previous analysis the university must guide efforts towards the development of two main activities: the decentralisation of the university activities in different locations and the development of strategic urban areas inside the University City.

First, the presence of the university's real estate within the most important socio-economic developments of Bogotá, brings exceptional conditions for the university. Accordingly, the long term real estate strategy is aimed to decentralise the university activities in specialised disciplines related with their future contexts in three different areas explained as follows and illustrated in Figure 5.8:

(1) "Marengo campus", located in rural land, will accommodate Forestry and Agricultural Sciences; Veterinary Medicine; Natural sciences; and other research activities related with emergent knowledge-intensive activities that seeks the development of an Agro-industrial cluster, which certainly requires the development of specific infrastructure such as laboratories and work fields occupying large extension of land that cannot be provided within the University City. Accordingly, the presence of other HEI's and firms in the area, interested in the development of this cluster, and the non-developed situation of the land is an advantage since the establishment of the technical and physical platforms necessary for its operation –ICT, transport, laboratories and housing infrastructures- could be designed, planned and developed within a public and private cooperation model involving the local authorities interested in the economic development of the region. In this way, this action can succeed only with the establishment of inter-institutional cooperation ensuring the development of complementary functions that prevent the isolation of the cluster with its surroundings, which could be the main threat for relocation of faculties and institutes.

(2) "The University City campus", located in the heart of the city, will accommodate the traditional areas of knowledge such as Human Sciences, Arts, Engineering and Medicine, which are related with socio-economic activities in the surroundings characterised by business and commerce services and the presence of diverse cultural and academic metropolitan facilities. For instance, the geographic presence of these faculties not only represents a relevant supply of professionals in these segments but an opportunity to create synergies with the context through the development of related activities and a range of general and tailored services offered to specific organisations such as consultancy to business, industry and public sector; support services; technology - knowledge transfer and licensing; continuing professional development; student projects; work placements; and hospitality and conferences. Actually, the current extension centres of the UCB link around 700 students and 900 teaching staff offering professional services [2]. Thus, the administrative activities of this centres could be partly accommodated in "Las Nieves and Gaitán buildings", located in the expanded city centre nearby the UCB. Likewise, specific activities relate with emergent sectors are outlined in the second activity of this action in the following paragraphs.

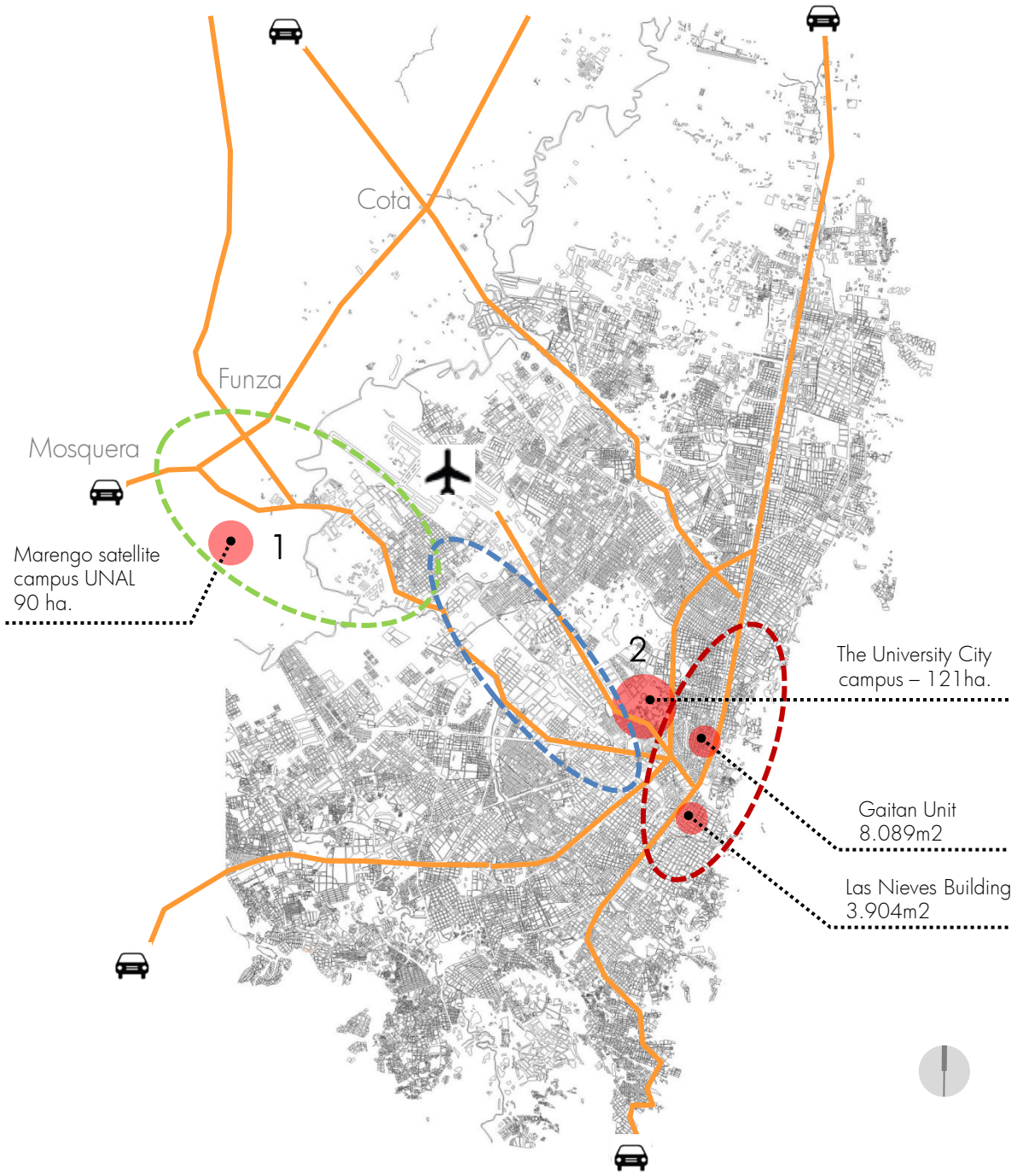
➔

Certainly, the high quantitative impact of this strategic action in terms of space and investments is obvious, which demands a high degree of flexibility in planning and existent organisational structures, since its success depends partly on the organising capacity of the university and its faculties. Therefore, the implementation of this action is planned in the long term which steps must be integrated with the other real estate decisions concerning the University City campus already mentioned and the ones described in the following pages.

Nevertheless, **"today's"** promotion of this decentralisation strategy with university community and external parties its crucial to implement it in the future, which certainly will bring difficult negotiations and need for agreements between parties involved.

[2] National Extension Directive UNAL, 2008

Figure 5.8. Decentralisation of the university activities in specialised disciplines related with their future contexts in three different areas.



Second, the development of strategic urban areas within the University City campus propose a set of projects that are aimed to highlight the presence of the National University of Colombia within the socio-economic development of potential areas. It does so, by using its location strengths as mean to achieve social integration. Accordingly, it is outlined the development of the so-called Homogeneous Zones J-K-L as a result of the Innovation Ring development in its vicinity (Figure5.9), which involves the following three operations illustrated in Figure 5.10 as well:

(1) The relocation of activities that currently takes place in this area but must be accommodated in Marengo satellite campus. In fact, it corresponds to the area occupied by the Faculties of Agronomy and Veterinary Medicine, and the Colombian Agricultural Institute (ICA) with few buildings and green houses of poor quality and image that do not fit in the future development of this urban area.

(2) The re-definition of functions and densities designated for these areas in the Regularisation and Management Plan - PRM, which formulation was previous to the development of important issues in the context of the Higher education in Bogotá, such as the Science, Technology and Innovation policy and the increased shift of the economy sectors into a serviced economy and its implications for universities. According to the PRM, the zones K and L has a variable and border density which allows renewal and high growth respectively. However, the zone J, where the Colombian Agricultural Institute (ICA) is located, is defined as a non growth density zone due to their Commodatum condition. In this sense, an due to the new orientation of the area, these three zones must be unified and redefined from the regulatory point of view in order to align University strategy with new city strategy.

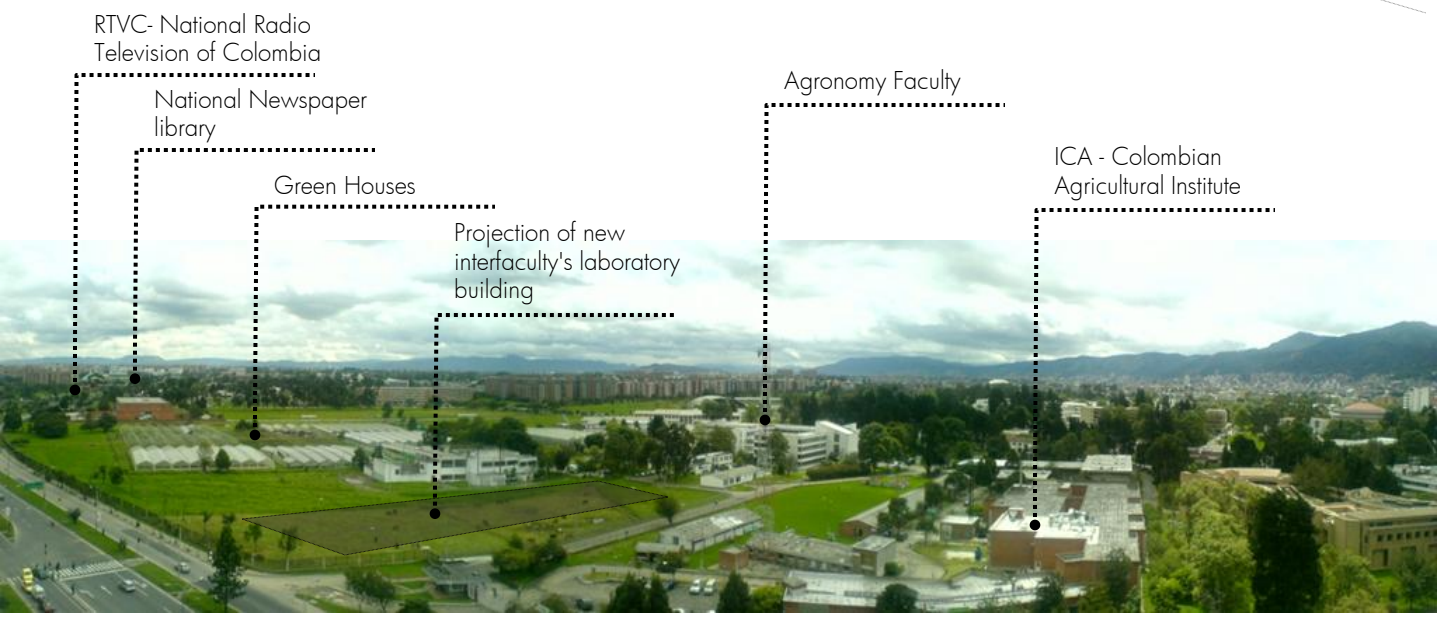
(3) The allocation of new functions related with the development of the Innovation Ring operation and its node in CORFERIAS. Accordingly, three opportunities are oriented to the establishment of a creative cluster related with the Audiovisual production and Media sectors, which according to economic studies has several potential for development in Bogotá: first, the advantaged location of the UCB with availability of land attractive for the future business-related activities; second, the physical presence of RTVC (National Radio –Television of Colombia) and the National Newspaper library; and the supply of programs such as Film and Television which new building project could be allocated in this area as well as media activities of the university such as UNIMEDIOS, UN Radio, UNIBIBLOS and Prisma TV.

Figure 5.9. Location of Homogeneous Zone J-K-J along the 26th Street where the Innovation Ring operation is located.

Besides these two main activities related with physical interventions described above, there are another "soft" ways in which the university could enhance social integration in this action line that certainly will have an indirect impact on the campus and perceived image of the university. This is related with the active participation of the university in the development of 45th Street sector in which the collaboration with others HEIs located in the area is crucial. For instance, there is no a specific integral plan for this area included in city developments, but the universities could take the initiative, that certainly will benefit them, and actively work with private sectors for the renewal of an area that could be the most important academic and cultural cluster of Colombia. In this regard, proposals for specialised student housing accommodation in a balanced mix of functions is expected in collaboration with real estate developers and agencies.

Figure 5.10. Proposed treatments for the development of the Homogeneous Zones J-K-L and current view of the area.

Bird's Eye



5.3 Implications and priority for decisions

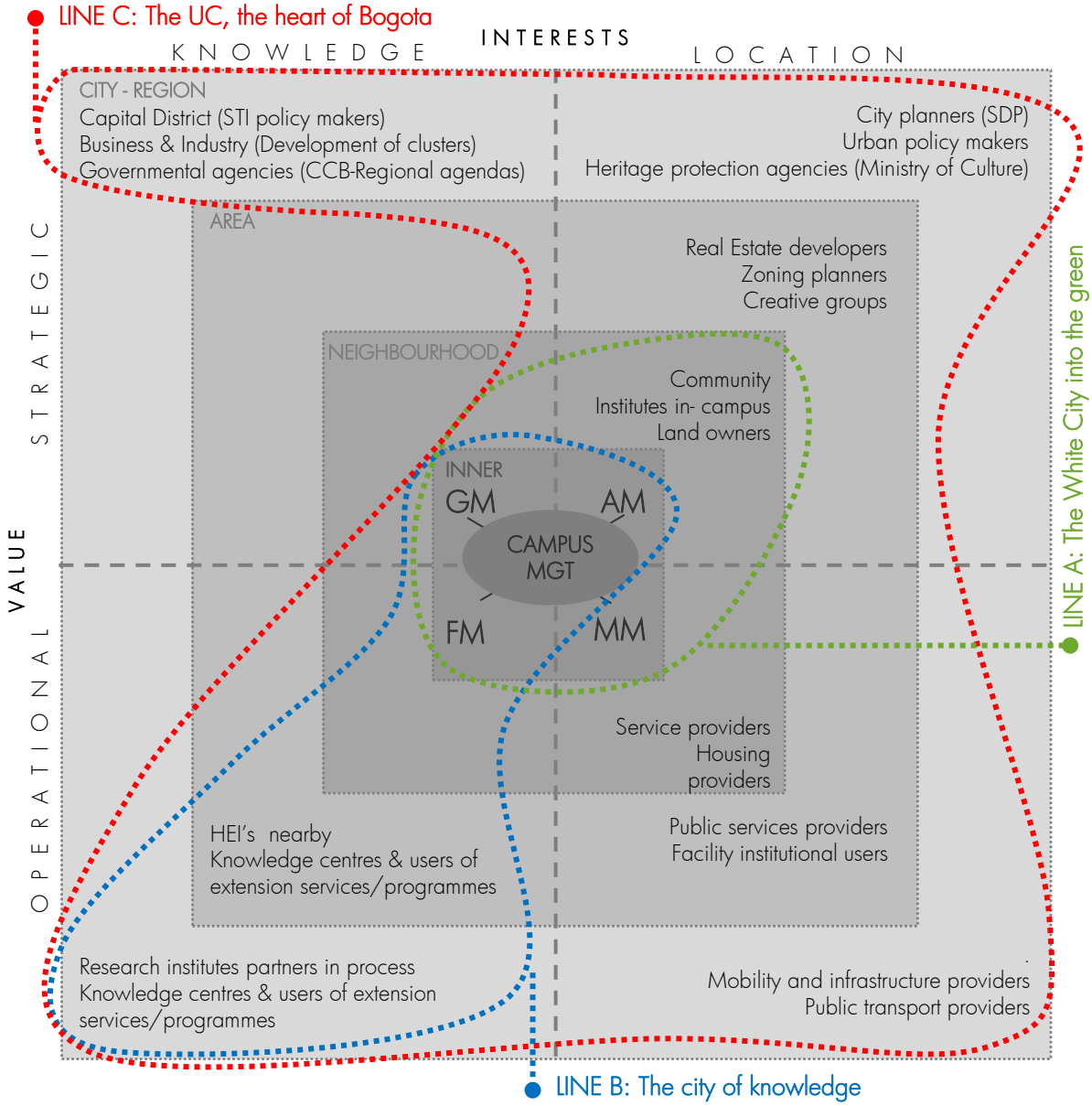
The previous set of guidelines for real estate decisions contained in each "Action Line" are meant to be intertwined and the priority for allocation of resources must be balanced according to the implications and interests of the stakeholders. In this regard, Table 5.1 summarises the relevant aspects in which the priority for allocation of physical and financial resources must be focused. For instance, these aspects are (1) the source of the demand, (2) the period of the implementation, (3) its impact in society including university and external communities, (4) its financial impact on university's budget and (5) its spatial impact at both area and portfolio level.

Accordingly, the socio, economic and spatial implications of this Action lines is predominant high. Likewise, the term of implementation depends of each action but at least one action of each Line must be initiated within the next 5 years. Furthermore, all three lines have their basis on internal institutional demands under the concept of "integration" that certainly brings the involvement of external demands which is predominant noticed in Action Line C.

Table 5.1. Lines of action and priority for allocation of resources.

The previous Table has indicated a number of relevant aspects to consider when giving priority for real estate decisions and execution of current projects which certainly will help to orientate the internal decision making process. Nevertheless, the lack of financial means still being an impediment to carry out the UCB's plans. In this regard, this strategic plan has positioned the three Action Lines according to their scale of impact at city, area and neighbourhood levels, which based on the findings of this research, the presence of diverse urban stakeholders interested either on the quality of knowledge provided by universities and the quality of its location within these three levels, distinguishes opportunities for synergetic relationships –in terms of social acceptance and alignment of policy- and therefore to obtain complementary financial means through external cooperation. As it is illustrated in Figure 5.11 the chances to find these opportunities seems to be wider for Action Line C since a larger number of stakeholders interested on knowledge and location are involved at all three scale levels of strategy impact.

Figure 5.11. Positioning the Action Lines with external stakeholders according to their level of urban impact



5.4 Underpinning activities

The success of this strategic plan is grounded both in the internal and external "organising capacity", essential to achieve an efficient and effective management of the campus. According to van den Berg, Braun and van den Meer (1997, cited on Berg, L. van den, ed. 2005), *organising capacity* refers to the entire process from the identification of certain needs, through the development of strategies and policy, to the implementation of the policy and the monitoring of the results. Therefore, this strategic plan provides campus managers with the half of the process; identification of its needs, the development of strategies and improvement of real estate policy. However, its implementation and monitoring ,depends on individual skills and knowledge, social and political support from university community and synergy with external parties involved.

Skills and Knowledge

Management is a complex task which at the end is left in hand of individuals where knowledge and competence solving problems matters. Therefore, as it has been evidenced in this research, campus managers are in a difficult task to bring together many factors influencing the campus as a real estate object. In this context, flexibility and adaptability to new circumstances is required, since unforeseen and complex situations will arise when implementing a strategy. In this case, a set of interventions involving large investments are already taking place in the campus and some of them are in conflict with this Strategic Plan. Accordingly, there is a need to evaluate the current and future projects in the short and mid term that needs to be redefined and adapted according to the Action lines which coordination requires not only skills but experience. Similarly, since one of the Action lines of this strategy is based on the urban integration of the campus with the city, it success depends on the network capacity of campus managers to put all stakeholders together to carry out these plans.

Social acceptance and support

University managers are in the difficult position of balancing and prioritising the multiple and sometimes competing interests of diverse stakeholders. For instance, university officials responsible for managing the campus bear large responsibilities not only for their own conduct but also for the broad impact of their policies and practices. The university may have similar status as other large corporations but also enjoys greater public authority as well as public responsibilities and social engagement since university administration acts in ways that take the interest of others and of a greater good into account. Therefore, ethics matters and campus management practices must be ruled under principles such as transparency and reciprocity. The first one requires information channels allowing stakeholders to comprehend the interests, intentions and capabilities of each others. The second one requires that all interested party achieve some form of mutually advantage exchange through sustained cooperation. In this context, the well promotion and delivery of the strategy among the stakeholders interested is essential.

Synergy with the context

There is no doubt Universities and the Cities share higher goals such as to contribute to economic and social development, to improve the quality of life and to attract talents and knowledge workers. However, the alignment of these goals depends on the level of openness of the university with its context and the ability to align common interests and goals. In spite of the level of engagement of universities with their surroundings city, district or neighbourhood, they still need to maintain both physically and programmatically the independence required for the production of knowledge. For instance, this requirement is assumed in different ways and depends on the character of the university and its socio-economic environment, which sometimes leads to openness or reticence in campus development. The challenge for campus managers, specially in public institutions, is to balance universities' engagement with their surroundings and use it for the benefit of campus development as well as to contribute for city development.

Therefore, support from the city is also need it. In this respect, there is a need of collaboration with city planners and be aware of relevant developments in society, economy and urban context, involving higher education institutions and its campuses.

5.5 Feasibility and associated risks

The range of Action Lines of this strategic plan is varied and rooted in wide perspectives related with institutional, socio-economic and urban dynamics with high impact for the National University of Colombia. In this sense, the strategy has a certain degree of flexibility which could be threaten by internal or external changes in wide structures. For example, Line A which has its basis in the current Vision-2017, could be at risk if the higher goals of the university changes in the short term and changes in administration gives priority to other aspects rather than image. Likewise, Line B which is based on future spatial demands related with expected growth in students population and ICT developments, could be threaten in two ways. First, if dynamic changes in learning processes and working environments are not considered in the planning process and second, if an unexpected growth of student population take place. Finally, Line C which is rooted in future socio-economic and urban developments, could be at risk if structural changes on city developments, regional policies and urban structures take place. In order to give a better insight on this aspect an evaluation of the feasibility of the plan is given at three levels: social, legal and financial.

Social Feasibility

Certainly the concept of integration and its three Action Lines are aimed to benefit the university community and the citizens society. However, the success of the integration depends of the level of acceptance or reticence of both internal and external community. For instance, the UNAL needs to improve its level of commitment with society as a provider of knowledge not only within the campus walls.

In this regard, the UNAL needs first, to gain the acceptation of internal community by promoting the physical improvement of the campus as a benefit for the university community and the relevance supporting the quality of the education in line with its institutional missions; and second, to improve the level of involvement in solving problems at area and neighbourhood levels beyond university borders, for example by using its knowledge for the benefit of the area in its vicinity that certainly will have a positive impact and wide acceptance among citizens and urban authorities.

Certainly, "open the university" seems a difficult task, both spatially and socially. Indeed, some initiatives has been pursued during the last administrations but the strong conservative position of the university community –including managers, students and staff- has been a barrier and constitutes one of the main threat of this strategic plan. Nevertheless, the analysis of Bogotá in the context of the knowledge economy has permitted to identify relevant changes in socio-economic structures happening in Colombia as well as other countries in Latin-America, which are nowadays in a process to adapt a model that certainly need a change in culture as well. In this positive context, universities must assume their relevant position as "institution" defined by Clegg et al. (2008) as a *recurrent patterned form of activity that fulfils basic functions for a society*. It does so by promoting **social integration** from their strengths: education and production of knowledge, for example leading projects that promote the inclusion of community in universities decisions and solve problems of their immediate surroundings such as the improvement of the quality of student accommodation and its functional impact at area level.

Legal Feasibility

The existence of an internal real estate policy which guides the spatial planning and physical interventions in the UCB campus is a relevant tool for campus managers in the implementation of real estate strategies such as the one presented in this study. Actually, the presence of a legal spatial model recently developed and aligned with academic needs and institutional vision, acts as a facilitator to implement the Action Lines described in this strategic plan. Indeed, Lines A and B are strongly tied to the current internal policy (Physical Spatial policy and PRM). However, it is outlined the necessity to improve this policy through the inclusion of complementary regulations for specific actions such as upgrading and expanding the portfolio in line with green and sustainable solutions not considered yet as requirements within the current policy. Likewise, an implementation of an integral monitoring system for the portfolio in the mid-long term must be included as part of the policy which nowadays is absent. Furthermore, for the success of this strategic plan it is suggested to reconsider the use of specific regulatory tools such as the "Buildings Intervention Manual" which misunderstood usage is becoming a barrier to upgrade ICT and innovative spaces. Therefore, the use of this manual must be complemented and updated according to specific needs of the faculties and their respective academic programmes.

In contrast, the implementation of Line C is tied to both internal (PRM) and external policies such as the POT (Strategic Plan of Bogota), and UPZ's (Zoning Unit Plans). For instance, the orientation of this Action Line which is partly grounded on future urban developments addressed within the POT and PRM facilitates its implementation. However, as well as spatial and social integration, there is a need of integration at policy level since the development of specific areas addressed in this strategic plan leading to urban integration between the campus and the city -such as the 45th Street Sector and the Homogeneous zones J, K, L- are regulated by different policies defining different treatments for each zone, including the campus. Indeed, the fact that the campus has been seen it as a separate element within the urban structure and its current administrative and regulatory division, emphasize their isolated condition and could be an obstacle for the implementation of this Strategic Plan which is grounded in the concept of "integration".
Similarly, there is little involvement within the current real estate policy regulating the property of external institutions located within the campus land as a loan for use. Certainly, the university has limited power regarding the use of the land occupied by these institutions but at the same time almost nothing is proposed within the policy that leads to integrate their positions in the physical development of the campus. Thus, to support the legal feasibility of this Strategic Plan, improvements in real estate policy are needed it.

Financial Feasibility

Certainly, this is a critical point for the success of this strategic plan since its implementation involves large investments in physical infrastructure. Accordingly, specific actions necessary for the development of the overall Strategic Plan -such as to upgrade and enlarge the portfolio- have a high capital cost that rises above the current projects addressed in the university's agenda. In fact, in order to upgrade and offer a new spatial supply according to the academic and institutional demands proposed in this strategy, the university needs to make an investment of more than €910 millions over a long-term period of 15-20 years (Appendix VI). This figure seems giant if it is seen as a one-time investment, but actually the UCB has planned an investment of more than €128 millions (Appendix V) to complete during the current administration –it means, within the next two years- distributed in separated projects from which seven, that sum up more than €58 millions, are feasible and 70% of the costs are already covered by a loan. In this regard, the strategic actions addressed in Line C are aimed not only to catch social but financial support from external parties interested on university's strengths: quality of knowledge and location. For instance, the sponsorship of the projects outlined in each Action Line must consider the level of involvement with external stakeholders according to their urban impact illustrated previously in Figure 5.11 as sources of financial support. Indeed, large projects such as the decentralisation of the campus in two locations with potential for economic developments could easily attract public-private partners interested on sharing spatial resources as well as implementation of infrastructure need it to carry out this project.

Furthermore, the high financial impact of this strategy not only involve investment costs but revenue benefits from the inclusion of high performance buildings and sustainable solutions within the future supply, including the improvement and expansion of the portfolio. Accordingly, the most obvious revenue benefits from high performance buildings, compared with conventional alternatives, are visible in reduction of operating costs in the long term: (1) lower energy costs - with savings rising as energy prices increase due to decrease of energy consumption;(2) lower waste disposal and water costs - which are also likely to increase quickly; and (3) Lower maintenance costs - due to reduced scale equipment and/or less complex building services.
Likewise, Action Line B, which opts for the optimisation of the space based on innovative concepts and increasing the flexibility of the current supply, will have a positive impact by optimising building's life-cycle costs. Since the HEI's in general faces many uncertainties about future funding and qualitative and quantitative spatial demands, giving priority to buildings easily adaptable reduce risks related with under-used facilities, high costs of adaptation and even the need of new buildings because the existing ones could be better used.

It can be said that the financial feasibility of this strategic plan depends on: first, the ability of campus managers to promote and negotiate the availability of sharing physical and financial resources with external parties involved in the development of the campus without putting at risk their institutional mission; and second, the successful optimisation of the current real estate supply that can only be achieved through strategic commitment, coordination of activities and attention to detail in design and implementation.

5.6 Limitations and recommendations

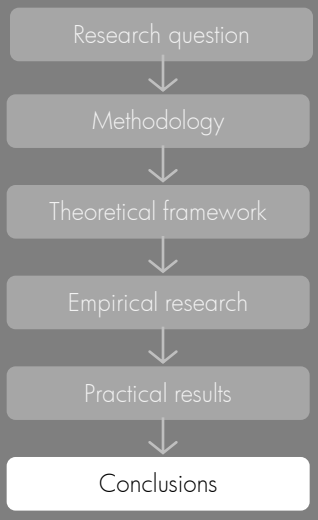
Since this Strategic Plan is focused on the improvement of campus management, which priority remains in the added value of the investments to the core of the organisation, a detailed financial plan is not provided due to the lack of data about the actual cost of the interventions and the large scope of the plan. Nevertheless, the data provided above about the financial feasibility is based on the approximated future quantitative spatial demands for the UCB and current average construction costs in Colombia (see Appendix VI). Nevertheless, to provide quantitative data in order to measure the financial implications of real estate strategies certainly matters and its recommended for real estate decisions, but is not the target of this research. Likewise, the general approach of this Strategic plan do no provide a specific plan of approach with defined steps for interventions. This is the result of the intertwined set of actions that needs to be balanced as guideline when taking real estate decisions and the large scope of the Strategic plan that indeed, which serves more as a framework for campus real estate decision. Therefore, the specification at the level of a plan of approach is not achieved in this case but recommended as next step for strategy implementation.

➔ Recommendation

Strategy Implementation.

According to the large scale of this Strategic Plan; the general character of its recommendations for accommodation and investment decision mainly planned in a long term vision; and the social implications of its actions, this research suggests that for the successful implementation of this strategic plan, it is necessary to start as soon as possible with the promotion of the three Action Lines within the University and local community as well as the wide range of urban stakeholders involved in the development of this strategy. It does so, for example through the settlement of a "Campus decision room" with the aim to induce preliminary agreements and prevent difficulties during future negotiation involved during the implementation process.

6 Chapter six
Conclusions & Recommendations



"Luck is what happens when preparation meets opportunity"

Seneca (Roman philosopher)

The quotation above suddenly appeared in the latest reading moments that accompanied this process, when developing a reflection of a long time study becomes a creative process, open to new ideas and critical interpretation of knowledge. Indeed, this phrase emerged by chance as a source of inspiration to conclude this study since it exemplifies the dual internal-external approach of this research, which results are basically recommendations aimed to improve the **internal preparation** required for campus managers to exploit the **external opportunities** evidenced through analysis.

In this context, this research will provide a bit of "luck" to the University City of Bogotá, which findings could be useful for many other Colombian and Latin-American universities as well. Thus, the metaphor of the "luck" refers to the "real estate management process" which, in the case of large scale real estate objects such as campuses, involves a number of external considerations beyond internal capacities, mostly driven by specific contexts.

Accordingly, this concluding chapter presents a critical reflection first, on the practical results of this research; and second, on the field of study by addressing how the academic insights were translated into practical advice capable to application and providing new contributions to the Real Estate Management discipline respectively. Likewise, some recommendations and perspectives for further research are outlined at the end of this chapter.

6.1 Reflection on practical results

Applying, designing and advising!

This research arose to solve a specific problem faced by the University City of Bogotá -object of this study- and other public institutions in Colombia, which was defined as "a need of means" to make an optimal use of university's physical and financial resources in order to support its institutional goals and visions. Therefore, in order to solve this problem which has two independent sources (internal-external), the basic assumption of this research addresses that "the real estate management of higher education institutions with large scale campuses is influenced by urban demands besides the institutional ones and therefore, they must be considered as complementary inputs for real estate strategies' orientation". In this context, the research was approached through the exploration of two management fields –CREM and UAD- that provided the following relevant academic insights supporting the hypothesis above:

(a) The social relevance of universities as "institution" within a specific context adds complexity to its real estate management by bringing externalities to the process which are beyond the context and instruments provided by Corporate Real Estate Management discipline in theory and practice. While universities share similar real estate goals with private organisations, their non profit status requires more subtle strategies to accomplish their real estate objectives. For instance, the number of available CREM instruments collected through literature and empirical researches, which do not point out real estate as an exclusive business profit generator, is limited. Certainly, the initial core of CREM theory "to obtain maximum added value for the business" (De Jonge, et al., 2000) has gradually shifted derived from research focused on non-profit organisations like government buildings agencies. However, the amount of instruments provided from this perspective is limited to specific instruments such as the framework for adding value (De Jonge, 1994; Krumm, 1999; Dewulf, De Jonge et al. 2000 cited in Den Heijer, 2005, pp.8). According to Heijer, A. den (2005) "It might be more accurate to replace corporate with institutional: institutional real estate (IRE). Corporate is associated with profit – as the only goal – whereas many institutions have more diverse goals, political goals for instance. Identifying these goals is the first step in the process of adding value".

(b) The large scale of campus as a real estate object and the conditions of its physical settlement as well as their roles in the urban context define specific urban relationships and impacts at different levels (neighbourhood, area and city) that certainly influence the management of the portfolio strongly tied to its urban context. Thus, the real estate management of campuses must be complemented with instruments provided for instance by Urban Area Development (UAD) and University Real Estate Development (URED) as complementary fields of knowledge within the Real Estate Management discipline.

(c) The suitable instruments identified from the mentioned areas of expertise aimed to improve campus management are interrelated and likely to be used in a complementary way.

➔Basic theoretical insight

CREM
Corporate Real Estate Management is a matching process between demand and supply, with activities from operational to strategic level and the overall goal to optimally attune real estate to an institution's performance. (Heijer, A. den, 2008)

UAD
Urban Area Development is defined as a complex set of processes, in which many actors and organizations together want to achieve spatial development, in which many stakeholders, at different levels, input or claim, in which cities compete internationally and events far beyond the region may have directly affect on the area, in which every actor has his own definition of the problem and the interests of major actors may greatly differ from each other. (Chen, Y., 2008)

URED
University Real Estate Development is a new area of academic and applied inquiry that explores the ways institutions of higher education expand outside of their traditional campus boundaries. The research area is developed by The Lincoln Institute of Land Policy and it is a free database accessible to all. (Lincoln Institute of Land Policy, 2009)

Practical insight

Analytical layers aimed to improve campus real estate management:

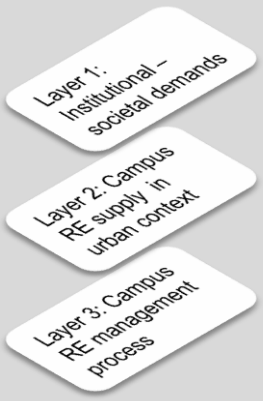
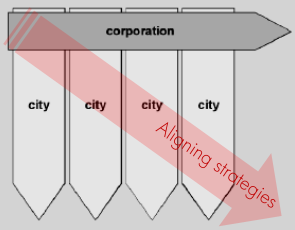
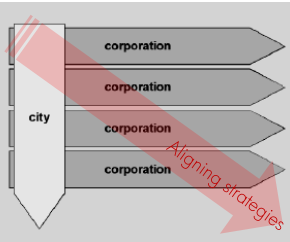


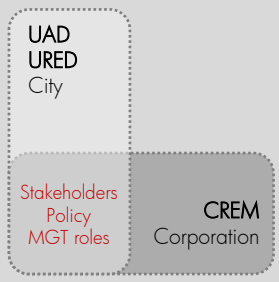
Figure 6.1. Managing symbiosis between Corporation and cities: aligning strategies. Source: De Jonge & Den Heijer, 2008





Practical insight

Primary aspects involved in the management of campus as real estate object:



These academic insights were translated into two products: First, the design of a "conceptual framework" applied and tested during empirical research phase; and second, a "strategic advice" presented in the previous chapter capable of application in practice.

Accordingly, the first output is a direct and individual interpretation of the available knowledge in a broader scholastic manner, which attempt to organise the use of multiple instruments -available in theory and other empirical researches- into an intended frame that facilitated the analysis phase of this research and permitted to identify three "analytical layers" to improve campus management: L1- Institutional-societal demands; L2- Campus real estate supply in its context; and L3 – Campus management process.

Furthermore, it is crucial to establish clear relationships between instruments and their orientations in order to reduce the chances for deviations during extensive analysis, which are present when different means are used. In this regard, the conceptual framework was not simple to develop due to its early approach by trying to combine three areas of expertise (CREM, UAD and URED), driven by two elements: corporations and cities; while the first one focuses on corporations defined in the broadest sense: from public to private organisations, the remaining ones involve the management of urban areas where city is the main layout. Indeed, the attempt to combine these areas constituted a methodological approach failure, since despite their "overlapped condition" influencing the development of both corporate and cities strategies, they still different management fields (Figure 6.1). With this in mind, it was clear to identify which selected instruments pertaining to each different field could be positioned within these overlapped areas and are likely to complement each other. Indeed, the crossing review of instruments supports that the management of real estate objects such as campuses involves three primary aspects from the urban perspective:

(1) *Diversity of Stakeholders*: presented as individuals, groups of people or representative bodies (inside or outside university) with different and sometimes contrasting goals, interests and needs on campus, which demands constitute the main input for real estate strategies in hands of campus managers;

(2) *Diversity of Policy*: guiding the development of campus real estate supply, which according to its large scale size it involves internal and external policies at different scale levels which sometimes facilitates or difficult the implementation of real estate strategies developed by campus managers; and

(3) *Dynamic management roles:* the shift of the real estate management role from operational to strategic –addressed by many authors in CREM theory- is indeed cyclical and complementary rather than additive and it is driven by three independent variables, which are specific to each organisation, in line with it context: institutional goals and policies; accommodation needs; and real estate supply. Accordingly, a model addressing the cycle of the management role was developed as an academic insights and explained in the second part of this reflection.

The second output is the application of the previous academic insights on a specific context, synthesised into a practical advise for the University City of Bogotá. Therefore, this practical advise was drawn up in a form of "strategic plan" guiding the allocation of physical and financial resources of the mentioned case aimed to improve its campus management and described in the previous chapter. According to the feasibility evaluation of this Strategic Plan, it is outlined that besides the evident financial and regulatory implications -present in any real estate strategy- there are several social and urban issues influencing campus real estate strategies in a positive way that are relevant to improve campus management. For instance, these issues are strongly associated with a specific context driven by socio-economic structures that are different in every case. Therefore, the orientation of campus strategies and policies should respond to specific situations and references from practice must be adapted rather than transferred. In this context and based on the practical results of this research, the following issues -categorised by their impacts on campus management as "hard and soft"- deserve a critical reflection:

ACTIVE promotion of social integration through Campus Real Estate strategy

There are specific examples in which campus real estate strategies can lead to social integration in an active way. For example, creating environments for knowledge diffusion and working environments through area based developments such as tech-parks, where the knowledge exchange process between organisation and HEI's leads to cooperation instead competition. Therefore, the idea of clustering as mean to achieve knowledge diffusion through spatial proximity is an option but there is a related risk to loose urban integration at other levels, due to a possible exclusion of groups not related with the knowledge-intensive activities within this kind of clusters. Thus, managing this tension is a great challenge for cities which may opt for "urban diversity" and "cultural openness" addressed by authors as Jan Jacob Trip (2007) and Richard Florida (2002) as drivers for innovation, attractors for talented people and prime generators of urban economic wealth. In this regard, the analysis of the city of Bogotá in the context of the knowledge economy based on a model developed by Leo van den Berg et al. (2005) provided fruitful knowledge on how business life and academia can reinforce each other through settlement of initiatives such as policies and plans which success is grounded on the quality of seven established knowledge foundations. Indeed, being universities the engines of the so-called "knowledge base" foundation, campus real estate strategy involving the developing of urban areas could be one of these initiatives.
Accordingly, besides its knowledge base function, universities could exploit the provision of cultural amenities and services supporting their real estate strategies that certainly lead to social integration and urban openness and consequently reinforce other knowledge economy foundations such as the "quality of life" which is crucial to attract talented students and retain knowledge workers.

➔ Practical insight

General recommendations to improve the management of the campus from the dual internal-external approach of this study:

a. Identification of campus strengths and weaknesses in relation with its specific contexts in order to take advantage of existents and emergent opportunities outside, presented in form of plans, policies or strategies involving higher education institutions and therefore campuses.

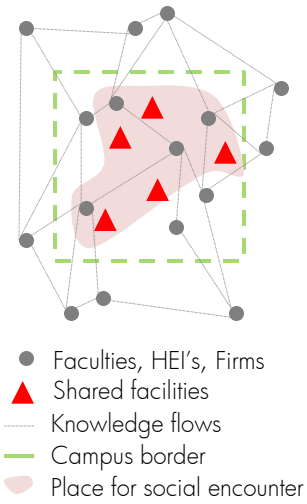
b. Evaluation and redefinition -if it is necessary- of current campus plans and measures supporting institutional goals in relation with its strengths, weaknesses and opportunities in its context.

c. Identification of external stakeholders distinguished in three levels: city, area and neighbourhood will permit to define the prior alliances and partners according with the scale level of their specific projects on campus.

In fact, attention must be paid to the quality of: (1) university facilities, such as buildings within the portfolio which allocate cultural and sport activities that can be shared with external actors; (2) the architecture and design of the built environment as a whole; and (3) the public space which use could be encouraged with the promotion of cultural activities, events and functions that generate opportunities for societal encounter and will not be in conflict with the institutional missions. Certainly, the inclusion of these last issues within a real estate strategy can help to break the actual gates of the campus and prevent social exclusion as a result of a mono-functional area exclusive for the academy, and therefore it will permit universities to integrate better with the city.

Practical insight

Spatial model for campus real estate strategies socially integrated.



In this regard, Jan Jacob Trip (2007) in his study "Assessing quality of place: a comparative analysis of Amsterdam and Rotterdam" suggests that Quality of place is achieved through the existence of ten elements and their respective indicators (Table 6.1), from which eight are directly related with the presence of higher education institutions and could take place within campuses and their vicinities. Certainly, some of these elements of "quality of place" –highlighted in Table 6.1- are considered as relevant to support social integration through Campus Real Estate strategy. Thus, the challenge for campus managers is to promote and negotiate the availability of sharing physical resources with external parties interested in use these spaces and encourage "Quality of place" as well, without putting at risk their institutional mission. However, in some contexts -specially in public universities- the ownership of the land may can hinder social integration due to its non-marketable and institutional character, which value is more symbolic than economic. This issue brings complexity when developing real estate strategies in collaboration with external parties, despite the advantages related with location and presence of complementary functions for the city. As it was stated before, social integration of university with their urban contexts depends on their level of acceptance of university community and society. Indeed, this is a serious barrier in the Latin-American context since "land" is a symbolic and "misunderstood" resource of public universities to remain autonomous, which leads to reticence instead openness for urban integration.

Table 6.1 Insight of main elements of Quality of place provided by HEI's and their relevance for campus real estate strategies. based on a list of quality elements and indicators developed by Jan Jacob Trip, (2007)

Main elements of Quality of Place and indicators suggested by Florida and related Literature

QUALITY	INDICATOR
Diversity	Functional diversity, distinctive neighbourhoods, sufficient density
Specific amenities	Individual sports facilities, recreation areas and restaurants per capita; (semi)-public spaces for informal meetings (third parties)
Liveliness; culture	Cultural and musical events; live performance venues per capita
Technology; innovativeness	Patents per capita; relative percentage of high-tech output
Talent	percentage of people with a bachelor's degree and above
Creativity, bohemia	Percentage of artistically creative people
Tolerance; openness	Relative percentage of foreign-born people; idem gays
Aesthetics	Architecture; parks; urban heritage
Environment; sustainability	Natural environmental assets; environmental quality; reuse of older industrial sites
Safety	Crime figures

Relevant for Campus RE strategies

Provided by HEI's

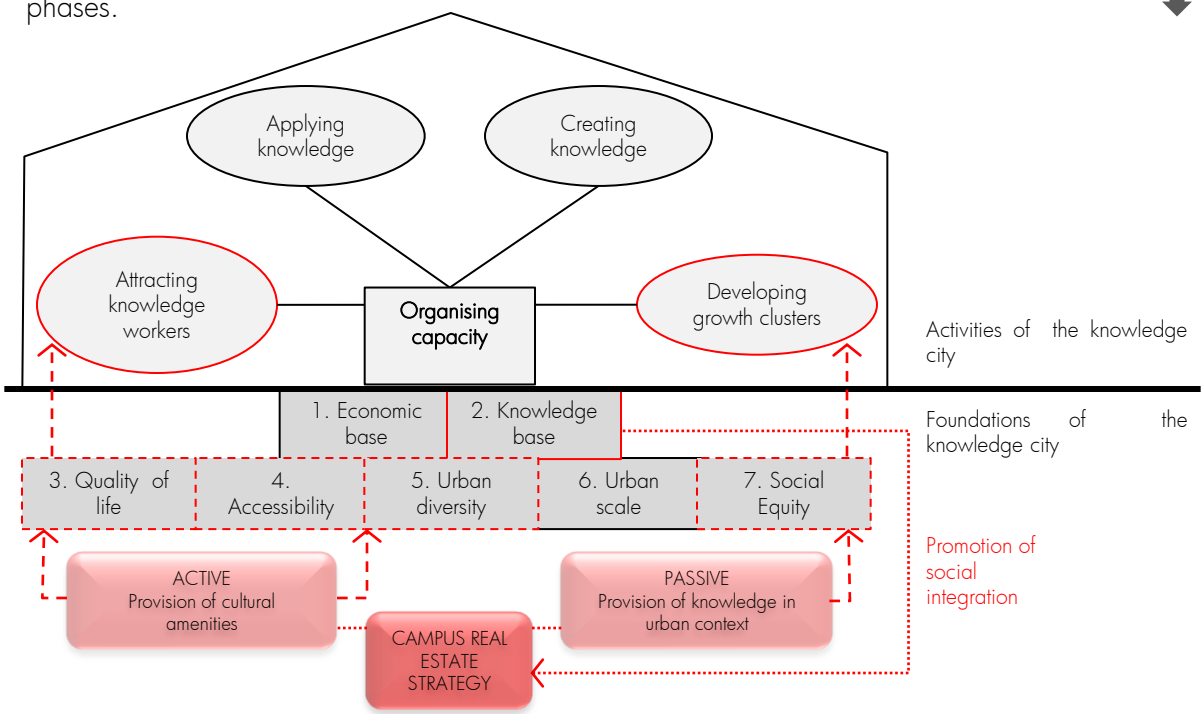
SOFT promotion of social integration through Campus Real Estate strategy

Another example leading to social integration but in a passive way is the inclusion of complementary urban projects in a broad perspective within campus real estate strategies that consider the development of urban areas in their vicinities. For instance, Universities can play a role as "problem solvers" to enhance urban integration through the use of their specialised knowledge at the service of society for example, by improving impaired areas in their surroundings. In this way, the involvement of community problems within campus real estate strategies can also encourage other knowledge economy foundations such as "social equity" which is actually the main threat for the success of knowledge economy in the Latin-American context. Indeed, the co-location of people within the same or at least a balanced economic and social contexts generates chances for better encounter and communication.

In this context, the empirical research -through the analysis of reference case studies in the context of the knowledge economy- showed up different subtle ways in which universities must be proactive and aware of the changing environment that influences the orientation of its higher policies and therefore their physical development. Thus, campus managers could actively propose real estate solutions for campus involving its urban context, according to universities' opportunities and strengths –including their role as knowledge base for a city- rather than sit back and wait to react on city planners proposals. Therefore, when designing real estate strategies, campus managers must consider not only the correspondence between real estate decisions and institutional interests but community and city ones. It does so, by involving external stakeholders demands since early campus decision phases.

➔ Practical insight

Campus real estate strategies and its role strengthening city's knowledge foundations in the context of the knowledge economy, through the promotion of Social integration. Based on The foundations and activities of the knowledge city model (van den Berg, L., 2005)

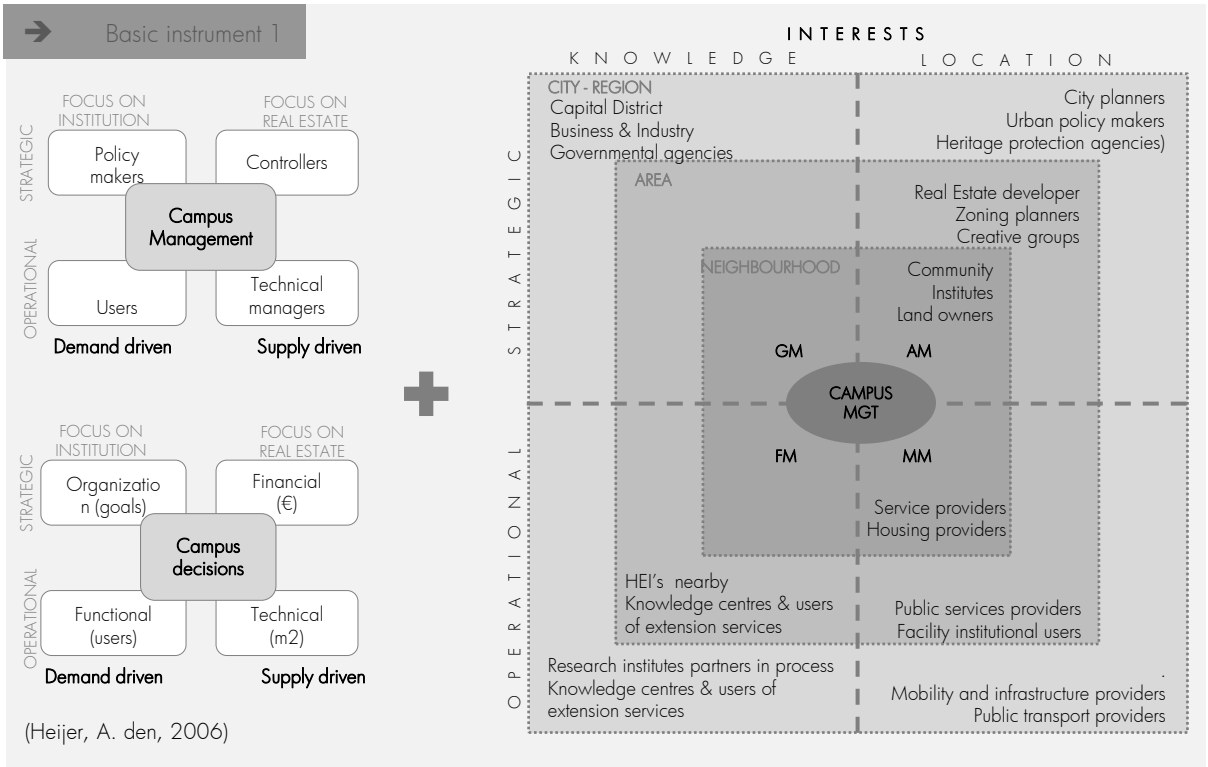


6.2 Reflection on the field of study

This research addresses a specific solution in the Colombian context for an actual problem faced by many higher education institutions overseas that deals with corporate real estate issues summarised as: *the diminishing of financial resources to support the changing and sometimes uncertain spatial demands of learning and working environments that involves the development of complex projects and the need of strategic campus management*. Accordingly, the practical results of this study confirmed that the improvement of Campus Management -as mean to solve this problem- can be achieved trough the complementary application of instruments provided by two mentioned areas of expertise: CREM and UAD that belongs to the Real Estate Management field of study.
In this regard, the previous part of this chapter provided a reflection on how the academic insights within this field of study were applied into a conceptual framework for analysis and a practical advise. Likewise, this part of the conclusions will provide fresh insights to the academy and its application within the professional practice.

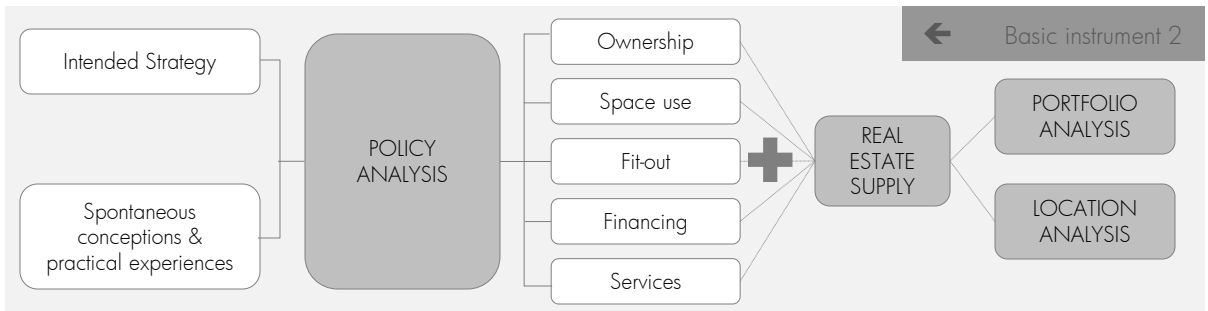
Applicability of real estate management instruments
Real estate objects such as campuses are recognisable large scale units composed by a number of buildings and large pieces of land strongly tied to its context. The theoretical and empirical phases of this research has evidenced that according to its dual scale position between portfolio and area levels, the improvement of its management involves three primary aspects: Diversity of stakeholders; Diversity of Policy; and Dynamism of management roles. For instance and based on these aspects, the crossing review of instruments -collected after a broad scan from theory and empirical research- suggests the use of three instruments considered as primary to improve campus management in practice:

(1) Stakeholder analysis: by using the "Basic framework for campus management, connecting four stakeholders' variables" (Heijer, A. den, 2006): The application of this instrument is crucial to identify the different actors and its diverse interest, who have a direct or indirect influence in the management of the campus. Indeed, the clear and accurate approach of this framework permitted to complement its use by adding the position of external stakeholders distinguished in three layers: city, area and neighbourhood. In this way, the internal demands of the basic framework driven by interests on institution and real estate linking four management fields are complemented with the external demands of individuals, group of people and bodies interested on the quality of the knowledge provided by HEI's and campus location. Indeed, the application of the basic instrument and its complement could be helpful to define the targets for interviews in empirical research; to align internal and external demands when designing real estate strategies; and to define the relevant alliances and partners when developing campus strategies according with the scale level of their specific projects.



(Heijer, A. den, 2006)

(2) Real Estate Policy analysis by using an academic approach developed within the Real Estate & Housing Department at TUDelft: The application of this instrument permits to identify the different legal tools used to control and manage the campus physical resources and its role facilitating or hindering the implementation of real estate strategies. For instance, the multilayer approach of this instrument is about comparing the words an organization expresses to indicate its strategic course with the actions it performs to attain the communicated objectives. Besides listening to what an organization is saying, one observes what is actually taking place. In this regard, and based on the practical results of this study, the use of this instrument can be optimised with two complementary analytical tools that are related with the five layers addressed in the Real Estate Policy analysis regarding the two scale levels of campus as real estate object: Portfolio and Location analysis. In this context, the application of the basic instrument and its complements could help to analyse the current situation of the campus in relation with internal and external policies that indicate the course of their strategies; to identify mismatches between plans and actions; and to improve real estate policy according to specific needs not addressed formally within intended real estate strategies.



➔ Academic insight

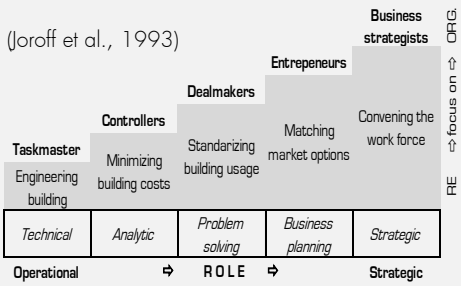
The so-called "dynamic cycle of Campus management roles" contextualise the complementary and specialised roles of campus managers in line with the four perspectives of adding value, which indeed shift dynamically from strategic, tactic and operational management forms, according to three Independent (internal-external) variables specific to each organisation and its context.

Accordingly, this management role cycle could have different starting points but always a direction in which the actions follow a plan which also follows a vision connecting the three independent variables. Thus, the campus management role change according to this logic and direction when designing, planning and implementing real estate strategies.

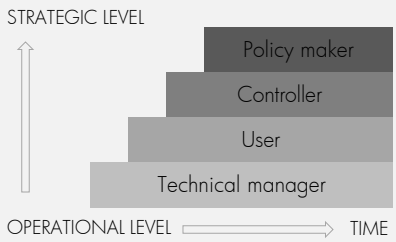
(3) Real Estate Strategy planning & implementation analysis by using the so-called "Dynamic cycle of Campus management roles" involving three independent (internal-external) variables –developed during the empirical phase of this research - which is an individual interpretation of the shift of the real estate management role from operational to strategic addressed by many authors in CREM theory and empirical research. Accordingly, this basic academic insight adopts the critical reflection of Heijer, A. den et al. (2006) on Joroff's model (1993), who argues that the five different approaches of his additive model on corporate real estate competency shift is not seen in all organisations. Indeed, according to Heijer, A. den et al. (2006) its development depends on (1) the type of organisation; (2) their real estate supply; and (3) their accommodation needs.. Based on this statement, these academic insights were re-interpreted during the empirical phase of this research by modifying the linear and additive structure in which the role of the real estate management is framed into a cyclical scheme in which the management role is the result of complementary specialisations and is driven by the three mentioned independent variables specific to each organisation and its external context. Certainly, this approach was a result of the application of complementary instruments such as "Area development analysis" and "stakeholder analysis" during the empirical phase which permitted to contextualise the internal and external aspects required to improve campus management with the actual university problems and the variety of stakeholders involved. Therefore, this model can be use in practice to evaluate the orientation of real estate strategies and the role of the campus managers when designing & implementing them, where type of organisation, accommodation needs and real estate supply differs according to its socio-economic and urban context.

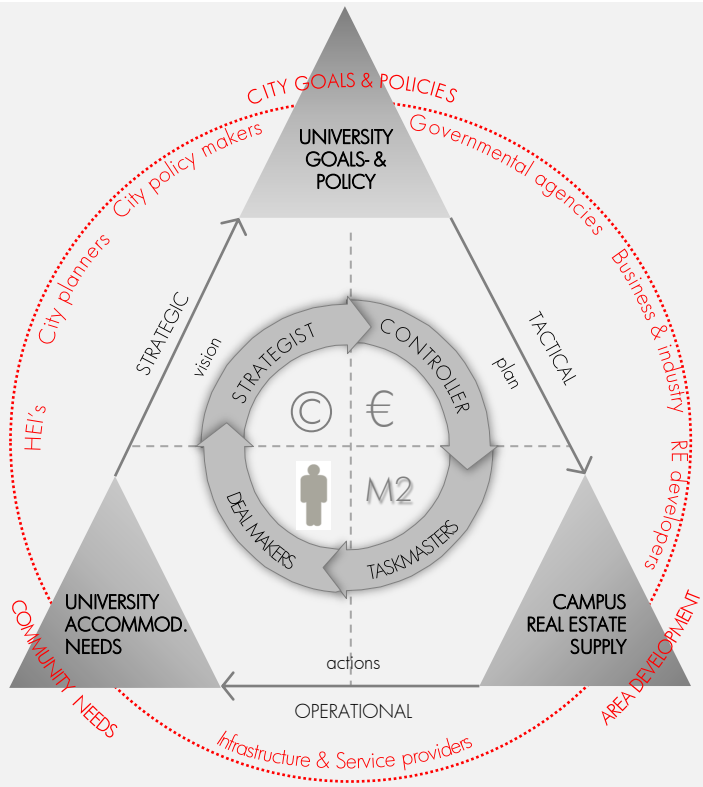
➔ Basic instrument 3

(Joroff et al., 1993)



(Heijer, A. den, 2006)



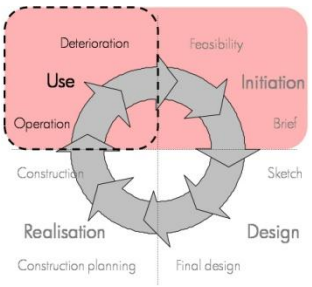


All in all, the complementary application of these primary instruments during empirical research will lead to identify areas to improve the management of campuses from different perspectives within the real estate management discipline (demand–supply and organisation-real estate) that could be applied to other large scale real estate objects with similar physical conditions in the urban context and also relevant in the context of the knowledge economy such as Business parks, Tech-parks, Business and cultural fairgrounds and Sports complex.
Likewise, it is relevant to address the application of primary instruments focused on the demand side like the combined internal-external approach of the Stakeholders analysis, which certainly is crucial when designing real estate strategies but could be applied successfully whe designing "briefs". In this regard, it is outlined the relevance of rec estate management tools which application can be used not onl during the use but the initiation (or redevelopment) phase of th building process. Therefore, the practical and academic insights of thi research and its dual internal-external approach goes from the scope c campus managers towards campus designers and planners as well.

Practical insight

Applicability of complementary Real Estate Management tools focused on the demand side during the initiation phase of the building process.

RE MGT position



RE MGT tools

References from practice and the relevance of the context

The initial methodological approach of this research intended to use Dutch case studies as references to improve campus management of a specific case in the Colombian context. However, the orientation and new inputs of the exploratory phase of this research and the in-depth and extensive analysis of the pilot case study in a limited period of time, suggested the review of case studies available in literature and previous empirical researches, in which the application of campus strategies, policies or even initiatives in relation with their urban context was used to select them as relevant references to improve the management of campus.
In this context, the number of case studies found trough literature review was limited to specific empirical researches. For instance, it is outlined the usefulness of the study "*European cities in the knowledge economy*" (van den Berg, L. et al. 2005) that provided not only useful references from practice but a framework to analyse the context of the pilot case study. Since the knowledge economy is a trend that affects every city but in different ways depending on the specific local situation, positioning the assessment of Bogotá among the nine European cities assessed in the mentioned study, helped to identify similar conditions in different context and learn from the ways in which some of these cities are dealing with their weaknesses as best references in practice. Indeed, the advantage of this framework is that permits to analyse a set of defined "foundations and activities" based on specific local situations likely to compare with other contexts without taking in consideration quantitative differences overseas. Accordingly, this study suggests the use of comparable analytical frames instead benchmarks as reference tools, where best practices can be adapted according to specific conditions in different contexts rather than transferred. Nevertheless, the different solutions outlined in references from practice are strongly related with their contexts and the application and interpretation of reference tools must be used carefully.

6.3 Recommendations and perspectives

The ambitious goal of this research, which is to "improve campus management", brought a high degree of complexity to this research, since the meaning of the word "management " is very broad. According to Clegg, et al. (2008) Management is *the process of communicating, coordinating and accomplishing action in the pursuit of organisational objectives while managing relationships with stakeholders, technologies and other artifacts, both within as well as between organisations.* Therefore, what managers do is use these different technologies, knowledge and artifacts (all of them instruments) to help frame what is relevant and then manage it to contribute to the achievement of organisation's goals. In this context, this research has outlined how campus managers are provided with the knowledge and instruments offered by two complementary areas of expertise within the real estate management discipline: Corporate real estate management and urban area development. Accordingly, the large amount of instruments provided by this dual academic approach were difficult to integrate and there was room for deviations since as is stated above, improve management is an ambitious goal covering many aspects that cannot be addressed easily neither in a simplistic manner. With this in mind, this research provides a conceptual framework for analysis that fulfils its mission since it helps to structure the analysis into the two mentioned fields where campus as real estate object is positioned. Nevertheless, due to the large scope of the empirical research, a large amount of data was gathered and the analysis consumed more time than the expected, making the cross-conclusions very difficult to unify. In this regard, for future research addressing a large topic such as real estate management within a short period of time it is suggested to narrow the scope of the research by specifying which aspect of the campus management is aimed to improve.

Furthermore, it is outlined the first approach of this research, which focuses on improving campus management by using CREM as primary field and UAD as complementary one. However, the identification of the relevance played by external factors pertaining to the urban context within the real estate decision-making process in large scale objects such as campuses, opened a debate for the inclusion of social issues within real estate strategies -strongly associated with specific organisations and their contexts- not fully provided by the available knowledge on Corporate Real Estate Management, that can be addressed for future research within the real estate management discipline. Indeed, the results of this study and their social relevance –specially the analysis and synthesis phase- are aimed not only to the intended target (campus managers of the UCB) but a larger group of city planners, city policy makers and all actors involved with the development of knowledge intensive activities in the context of Bogotá and its region including managers of other HEI's. Certainly, the inclusion of the analysis of Bogotá in the context of the knowledge economy not only permitted to position the role of universities and opportunities to develop real estate strategies but collect valuable information that could be used for related researches.

Appendices

I. List of references
II. Analysis National context of higher education
III. Interviews with UCB's stakeholders
IV. Portfolio analysis data of the UCB
V. Physical infrastructure Projects of the UCB
VI. Quantitative impact on real estate decisions for the UCB

Appendix I. List of references

Literature

Acosta Puertas, J.,2009. *Ciudades de América Latina en la Sociedad del Conocimiento. Experiencias de investigación, innovación y creatividad*. Bogotá: División de Planeación Estratégica y Evaluación de Colciencias

Berg, L. van den & Russo, A., 2004. *The student city. Strategic planning for student communities in EU cities*. Hants: Ashgate

Berg, L. van den (ed.), Winden, W. van., Woets, P., & Pol, P. M. J., 2005. *European cities in the knowledge economy: The Cases of Amsterdam, Dortmund, Eindhoven, Helsinki, Manchester, Munich, Munster, Rotterdam and Zaragoza*. Hampshire: Asghate

Calder, A., Greenstein, R.,2001. Universities as Developers. *Land Lines, Newsletter of the Lincoln institute of land and policy*, 13 (4), 01 July, pp.1-4

Ceballos Ramos, O., 2008. El vecindario de la calle 45 en Bogotá. Barrios vs. universidades?, In: Universidad Nacional de Colombia. *IV Seminario regional de investigación Urbano Regional. Diversidad y desigualdad en los territorios contemporaneos*, Medellín, Colombia. 5, 6 and 7 March

Clegg, S., Kornberger, M., & Pitsis, T., 2008. *Managing & organizations*. 2nd ed. London: Sage, pp. 8, 661, 664

Dahlman, C., 2007. The Challenge of the Knowledge Economy for Latin America. *Journal Globalization, Competitiveness & Governability, Georgetown University - Universia*, 1 (1), pp.18-46

Dewulf, G., Krumm, P., & Jonge, H. de, 2000. *Successful Corporate Real Estate Strategies*. Nieuwegein: ARKO Publishers. Ch. 2, pp.27 -33, Ch. 3, pp.35-41

Garcia, B., 2007. Ciudad, Universidad y Universitarios. Bogotá, el vecindario de la Calle 45. Bogotá: Editorial Pontificia Universidad Javeriana

Heijer, A. C. Den & Vries, J.C., 2007, Aligning city and university planning for mutual goals. *Real Estate Yearbook 2007*, The Hague: Europe Real Estate Publishers B.V.

Heijer, A. C. den, Vries, J.C. de & Jonge, H. de, 2008, Building Knowledge Cities. In: H. Vande Putte et al. (eds.), 2008. *Corporations and Cities Colloquium*, Brussels, 26-28 May

Heijer, A. C. den, 2008. Managing the University Campus in an Urban Perspective: Theory, Challenges and Lessons from Dutch Practice. In: H. Vande Putte et al. (eds.), 2008. *Corporations and Cities Colloquium*, Brussels, 26-28 May

Heijer, A. C. den, 2005. Managing university real estate portfolios, generating management information for performance based portfolio strategies and real estate decisions. In: *European Real Estate Society - ERES Conference*, 2005, Dublin, Ireland. June

Ilsjan, V., 2007, Corporate real estate management (CREM) in Estonia. *Journal of Corporate Real Estate*, 9 (4), pp. 257 – 277

Jonge, H. de, et al., 2008, *Corporate Real Estate Management, Designing an Accommodation Strategy*, Delft: Publikatiebureau Bouwkunde, TU Delft. Ch.1, pp.7-23

Jonge, H. de, et al., 2007, *Corporate Real Estate Management, Designing an Accommodation Strategy. DAS frame useful instruments*, [pdf] Delft: TUDelft, Faculty of Architecture, Department Real Estate and Housing, pp.1-48

Perry D.C. & Wiewel, W. (eds.), 2005. *The University as Urban Developer. Case studies and analysis*, New York: M.E. Sharpe Inc., Ch. 1 and16

Perry D.C. & Wiewel, W. (eds.), 2008. *Global universities and urban development: Case studies and analysis*. New York: M.E. Sharpe.

Perry D.C., Wiewel, W., & Menendez, C., 2009. The University's Role in Urban Development: From Enclave to Anchor Institution, *Land Lines, Newsletter of the Lincoln institute of land and policy*, July, pp. 2 – 7

Robayo, J., 2006. La universidad del siglo XXI. *Plan de regularizacion y manejo Universidad Nacional de Colombia Sede Bogotá*, Bogotá, Unibiblos- Universidad Nacional de Colombia

Trip, J., 2007. Assessing quality of place: a comparative analysis of Amsterdam and Rotterdam, *Journal of Urban Affairs*, 29 (5), pp. 501–517

E-Reports and newspaper articles

Gehrman, E., 2010. Dream works: How two mayors broke the mold to rejuvenate their cities, *Harvard Gazette* [internet], 26 January. Available at http://news.harvard.edu/gazette/story/2010/01/dream-works, [Accessed May 2010]

Harding, P., 2008. *High Performance Buildings. The Business Case for Universities and Colleges*, [online], HEEPI -Higher Education Environmental Performance Improvement, March. Available at www.heepi.org.uk [Accessed 22 May 2010]

Jones, L., 2002. The improbable story of how Bogotá, Colombia, became somewhere you might actually want to live, *Grist Magazine* [internet], 4 April, available at http://www.grist.org/article/of5 [Accessed 16 April 2010]

Nordstrom, R. (ed.), 2002. Return on Investment: High Performance Buildings [pdf], *Minnesota Planning Critical Issues*, Room 300. Available on Minnesota Planning Internet site at www.mnplan.state.mn.us [Accessed 22 May 2010]

Tierney, J., 1998. The Big City; Civil Obedience, *The New York Times Magazine* [internet], 19 April, http://www.nytimes.com/1998/04/19/magazine/the-big-city-civil-obedience.html?scp=8&sq=mockus&st=cse [Accessed 16 April 2010]

Corporate- Institutional reports

Alcaldía Mayor de Bogotá, 2007. *Plan de ciencia, tecnología e innovación Bogotá D.C. 2007-2019. "Bogotá sociedad del conocimiento"* [online]. Available at http://www.bogota.gov.co/portel/libreria [Accessed 22 May 2010]

CCB, 2007. *Informe de Coyuntura Económica Regional Departamento de Bogotá y Cundinamarca* [pdf]. Available at www.dane.gov.co/files/icer/.../bogota_cundinamarca_icer_II_sem_08.pdf [Accessed 23 May 2010]

UNAL, Sede Bogotá, 2007a. Avalúo de Bienes Inmuebles Sede Bogotá-Ciudad Universitaria.

UNAL, Sede Bogotá, 2007b. Avalúo de Bienes Inmuebles Sede Bogotá-Otros predios

UNAL, Sede Bogotá, 2006. *Corredor tecnológico agropecuario para la sabana occidente. Universidad Nacional De Colombia – SENA CORPOICA. Plan Estratégico.* [pdf]. Available at www.unal.edu.co/viceinvestigacion/ct [Accessed 22 May 2010]

UNAL, Sede Bogotá, 2009. *Plan global de desarrollo 2010-2012. "Por una universidad de excelencia, investigadora, innovadora y a la vanguardia del país"* [pdf]. Available at www.unal.edu.co [Accessed 21 January 2010]

UNAL, Sede Bogotá, 2008. *Indicadores básicos – 2008.* [pdf]. Available at www.unal.edu.co [Accessed 21 January 2010]

Corporate- Institutional Websites

Bogotá City Portal, www.bogota.gov.co [Accessed 10 April 2010]

Bogotá Maps Portal, http://mapas.bogota.gov.co/geoportal [Accessed 22 May 2010]

Bogotá urban database, http://www.redbogota.com/endatos/index.php [Accessed 22 May 2010]

Colombian Administrative Department of Statistics-DANE, www.dane.gov.co [Accessed 21 January 2010]

Invest in Bogotá Agency, www.investinbogota.org, [Accessed 10 April 2010]

National Information System of Higher education in Colombia-SINIES, www.mineducacion.gov.co/sistemasdeinformacion/1735/channel.html, [Accessed 21 January 2010]

National University of Colombia Institutional portal, www.unal.edu.co [Accessed 21 January 2010]

Further readings

Helmstädter, E., 2009. The Knowledge Society. In: P.J.J. Welfens, J.T. Addison (eds.), 2009, *Innovation, Employment and Growth Policy Issues in the EU and the US*, Berlin: Springer-Verlag: Ch.11, p.207-223

Hoeger, K., 2007. Campus and the city. A join venture?. In: Hoeger, K. & Christiaanse, K., 2007. *Campus and the city Essays. Urban design for the knowledge society*, Zurich: gta Verlag

Klundert, M. van de & Winden, W. van, 2008. Creating environments for working in a knowledge economy: Promoting knowledge diffusion through area based development. In: H. Vande Putte et al. (eds.), 2008. *Corporations and Cities Colloquium*, Brussels, 26-28 May

Lind, H. & Lindqvist, T., 2005, Real estate management in the Swedish public sector, *Journal of Corporate Real Estate*, 7 (2) , pp. 178–190,

Lindholm, A. & Nenonen, S., 2006. A conceptual framework of CREM performance measurement tools, *Journal of corporate real estate*, 8 (3), pp.108-119

Lindholm, A. & Leväinen, K., 1996. A framework for identifying and measuring value added by corporate real estate, *Journal of corporate real estate*, 8 (1), pp.38-46

Liow, K. H. & Ingrid, N.C., 2008. A combined perspective of corporate real estate, *Journal of Corporate Real Estate*, 10 (1), pp.54-67

Musil, T., 2006. Critical issues in corporate real estate. Developing a better understanding of public sector project impact analysis practices, *Journal of Corporate Real Estate*, 8 (3), pp. 151-162

Raspe, O., & Oort F. Van., 2007. The Knowledge Economy and Urban Economic Growth, *Papers in evolutionary economic geography.*, 6. Utrecht: University of Utrecht & Urban and regional research centre

Schmitt, G., 2007. Three conditions for successful campus planning. In: Hoeger, K. & Christiaanse, K., 2007. *Campus and the city Essays. Urban design for the knowledge society*, Zurich: gta Verlag

Simons, R. A, 1993. What public managers could learn from the private sector", *Journal of property management*, Jan. – Feb

Sinoo, O. (ed.), 2007. The campus as status symbol?, *Real Estate Yearbook 2007*, The Hague: Europe Real Estate Publishers B.V., March

Sherry, B., 2005. Universities as Developers: An International Conversation, *Land Lines, Newsletter of the Lincoln institute of land and policy*, January pp.11-13

Wiewel, W., Kunst, K. & Dubicki, R., 2007, (in-press) *University Real Estate Development: Campus Expansion in Urban Settings*, Lincoln Institute of Land Policy

Wills, P.C., 2008. Corporate real estate practice in Australia, *Journal of Corporate Real Estate*, 10 (3), pp. 40-53

Zaiton, A. McGreal, S., Adair, A. & Webb, J.R., 2008. Corporate real estate strategy in the UK and Malaysia, *Journal of Corporate Real Estate,* 8 (4), pp.168–177

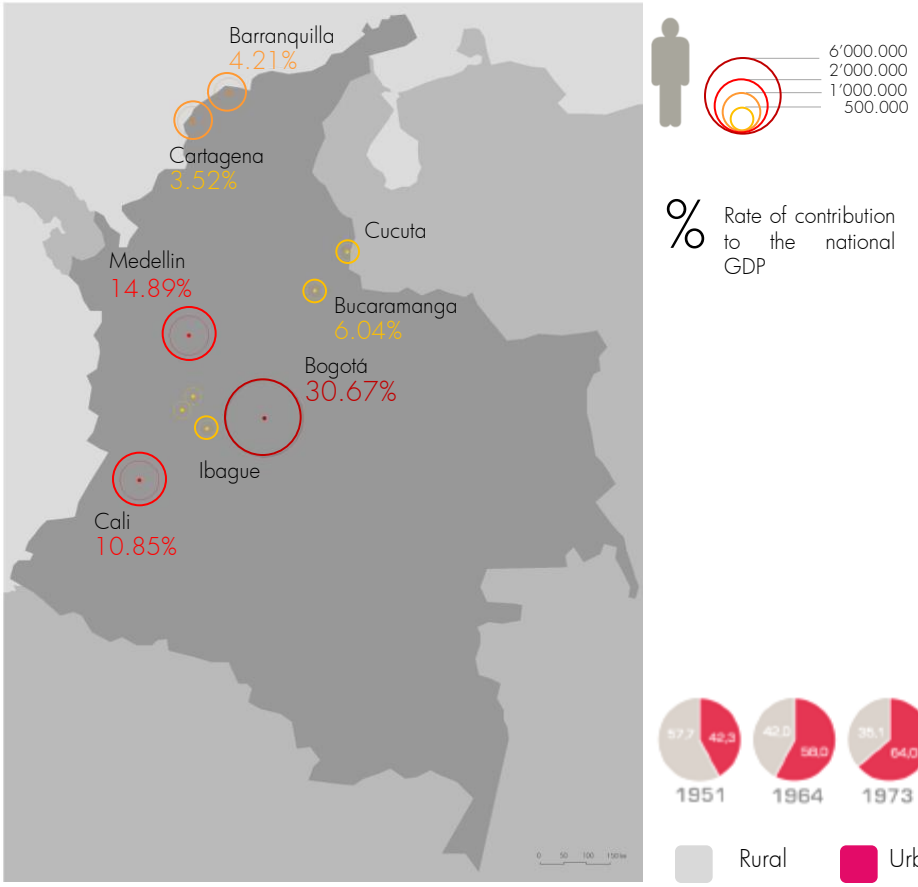
Appendix II. Analysis National Context

Colombia features

Colombia is located in the northern part of South-America (Figure 3) occupying an area of 1,138,914 sq km (CIA, World Fact book 2010). With a population of more than 43 millions of inhabitants [1] is the third largest population of Latin-America after Brazil and Mexico. However, 74% of the population lives in urban areas, with a density irregularly distributed along the territory (38,3 inhabitants per sp km approximately). Likewise, the concentration of services and industries is located in the major cities and its influencing regions, which together produce more than 70% of the GDP (DANE [2], 2008). The national industry is mainly based on textiles, food processing, oil, clothing and footwear, beverages, chemicals, cement; gold, coal, and emeralds. Thus, the GDP distributed by sectors is 52,8% services, 38,2% industry and : 9.1% agriculture. Furthermore the labour force corresponds to 58.8% services, 18.8% industry and 22.4% agriculture (CIA, World Fact book 2010). This figures explains the urbanization trend [3] (Figure4), in the country as a consequence of the lack of feasibility in the agricultural sector and the living conditions in rural areas. For instance, the major cities where population and main economic activity is located are Bogotá, Medellin, Cali, Barranquilla, Cartagena, Cucuta, Bucaramanga and Ibague. The population of this cities and their share in the GDP are illustrated in Figure 5 as follows.

Figure3. Location of Colombia in South America

Figure5. Population in major cities and their rates of participation in the national GDP

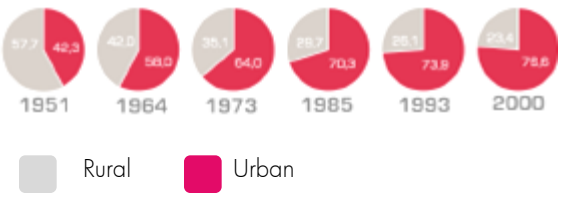


[1] The population of Colombia is 43,677,372 (CIA World Fact book, 2010)

[2] DANE is the National and Administrative Statistics Department

[3] The urbanization rate in Colombia is 1.7% annual rate of change (CIA World Fact book, 2010)

Figure4. Urbanisation process in major cities. Source: Ramirez, A., Magdalena; from a river towards a sustainable oriented waterfront, 2009



Colombia and its Higher education context

The higher education institutions in Colombia are classified by its foundation in officials and privates. Nowadays, Colombia counts with 283 higher education institutions denominated as IES[4] which accommodate 1'570.447 students (SNIES[5], 2009). According to their academic character, the IES are divided in four types: (1) Professional and technical institutes, (2) Technical schools, (3) University institutes and (4) Universities.

As well as the economic activity, the distribution of higher education institutions in the country has shown a concentration in the mentioned major cities by summing up a share of 84% of the total number of IES. Likewise, 79% of the total student population is covered for the institutions located in this urban areas (SINIES, 2009). Indeed, 110 of 283 institutions are located only in the metropolitan area of Bogotá which is 39% of the total share. The distribution of universities in the major cities and its influencing area, either by number of institutions and number of students is shown in Figure 6 below.

[4] Instituciones de Educación Superior

[5] National information system of higher education in Colombia

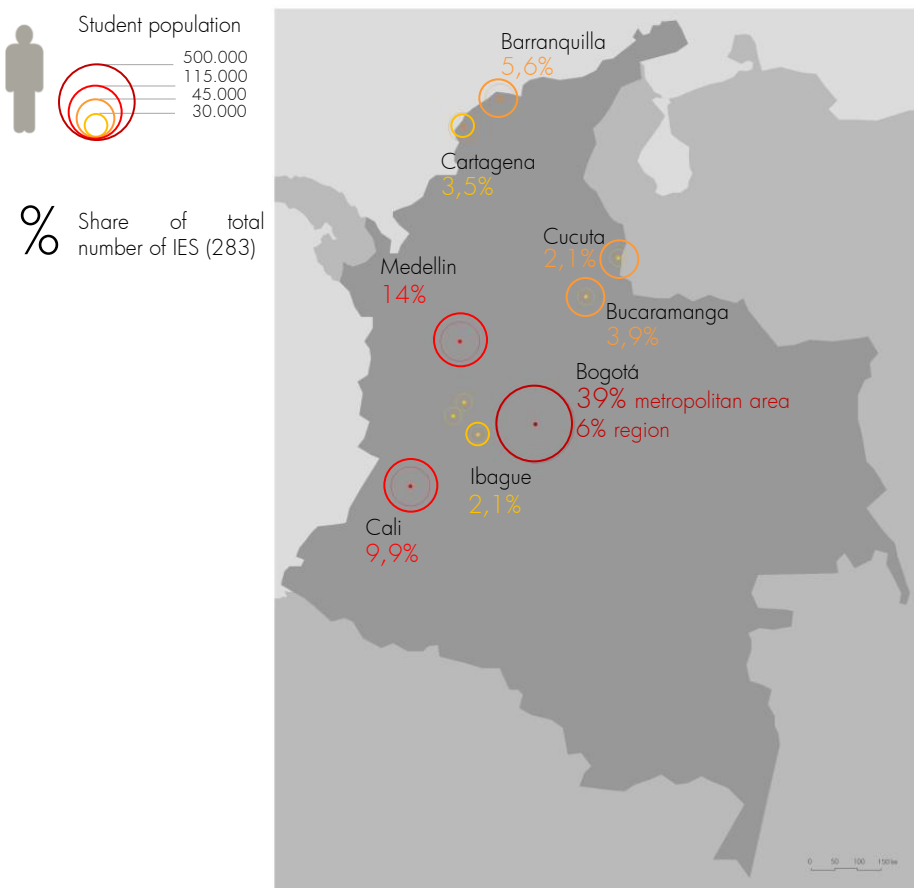


Figure6. Distribution higher education institution in the country per number and student population. Source: SINIES, 2009

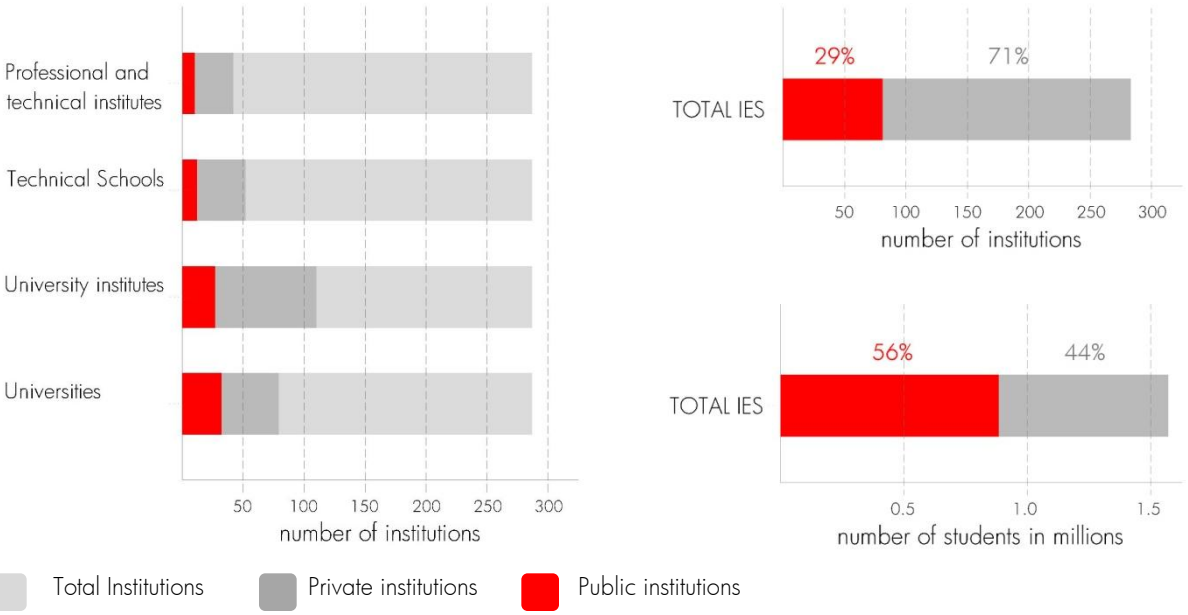
The distribution of this institutions between official and private universities is shown in Figure7. Accordingly, the share of private institutions is larger than public ones, with 71% of the total distribution. However, the public share covers 56% of the total student population (SINIES, 2010) which represents a relevant figure for development, since public universities maintain the access to education for mid and low income population. Accordingly, nowadays the country is facing a key transformation process in issues related with quality, coverage, management and governance and internationalisation [6]. In spite of the transformation efforts to increase the coverage, there are social inequalities that impede the access of vulnerable communities and its permanence in the system, such as the deficient formation in basic and secondary education, the high concentration of academic programmes in urban areas which generates exclusion of population living in rural areas and finally the high costs of the education for young people with income pressures in their households.

In the context of science, technology and innovation there is a low scientific and technologic production in higher education institutions, little and inappropriate use of ICT in academic and administrative processes, scarcity of human resource to carry out research and innovation and absence of policy to incentive strategic areas [7]. All together results in a pessimistic national panorama characterised by a low capacity for knowledge usage and knowledge production. Likewise, there is a few number of postgraduate programmes, low incentives to acquire it and use it within the country and absence of generational relief within the researchers' community with PhD. For instance, there is a need to promote the strategic relevance that high academic formation must have for institutions and the country, which is not assumed yet.
A contribution in this direction is the one framed in the recently approved Science, technology and innovation Law (Law 1286, January 2009), which modify the legal frame of the Law 23 of 1990.

[6] ASCUN, Colombian university association, Strategies and Policies for Higher Education in Colombia 2006 – 2010. "from exclusion to equity II" Towards building a higher education system more equitable and competitive for the country. Bogotá, D.C. 2007, p.80

[7] UNAL, National University of Colombia, Global Development plan 2010-2012. "For a university of excellence, investigative, innovative and to the vanguard of the country" Bogotá, D.C. 2009, p.33

Figure7. Distribution higher education institution in Colombia per type and foundation. Source: SINIES, 2010

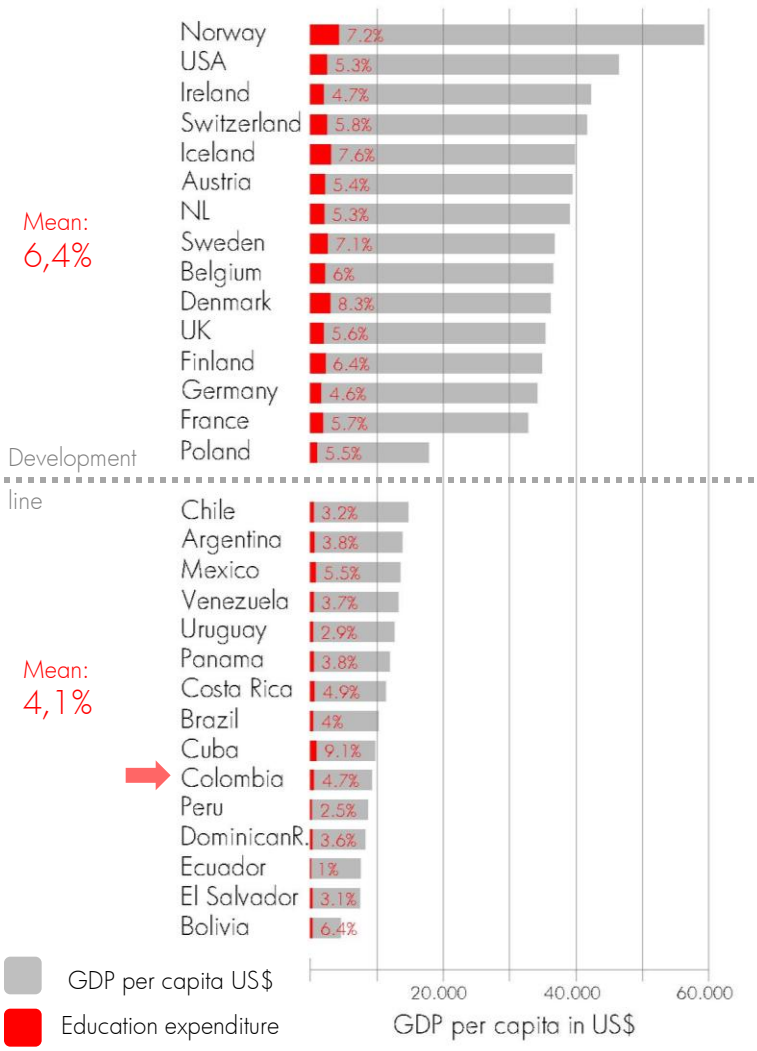


Accordingly, the goal of this law is strengthening the national system in order to attain a productive model based in science, technology and innovation by adding value to the products and services of the national economy and at the same time promote productive development and a new national industry[8]. Therefore, the main feature of this policy is upgrading the body in charge of the development of Science and Technology from Institute to Administrative department. It does so, by transferring it decision and participation power within the Minister Council when science and technology issues will be debated in national agendas. Likewise, this new legal body will have autonomy in the management of investments through a new fund also created under this law. Accordingly, this last aspect will ensure direct financing for research activities undertaken in the country, specially in universities. Likewise, it will creates a favourable environment for doctoral formation. In this sense, research activities become a strategic issue for universities from two point of views. First, it represents a possibility to obtain financing for research lightening the investment budget. And second, is an opportunity to count with a national system that promote the identification of priority areas for scientific and technologic development, which will be the basis for the continuous upgrading of doctoral programmes.

[8] Law 1286 of 23th January 2009, Chapter 1, General goal.

[9] Foa, Lisbeth, "Colombia increases the science and technology levels", Science and development network, February 2009

Figure8. Education expenditure rate of 15 developed and developing countries with higher GDP per capita. Source: CIA, World Fact book, 2010



This issue is the first response, in terms of national policy, to global dynamics in the context of knowledge economy, through which the country wants to strength its knowledge capacity in the international context. Thus, in spite of the Colombian economy is not knowledge-based, the education expenditure rate is 4,7% of the GDP (CIA, World Fact book, 2010), which is relatively high compared with other developing countries in the Latin- American context (Figure8). However, if we compare the education expenditure of this countries with developed countries in Europe and North-America, which economy is knowledge-based, the difference is vast since the difference in GDP per capita differs widely among them. On the contrary, the expenditure rate in Science, technology and innovation is very low; 0.5% of the GDP, which is planned to be increased at least up to 1% after the adoption of the new policy in the present year[9].

In contrast, during the last years a progressive diminishing of financial support of public universities has been evidenced. Notwithstanding the Law 30 of 1992 pretended to guarantee the contribution of the State, the effects of some decisions taken at national level by the government and the Congress through different policies, has demanded an increase in the results of mission activities in public higher education institutions. Indeed, demands such as the expansion of the academic offer and coverage, the creation and consolidation of research groups, the strength of relationship with business segments, internationalisation, decentralisation and extension among others, require the attainment of large resources. Nonetheless, the government has not provided the required counterpart by diminishing its budget.

As a result, the universities have important responsibilities and opportunities in this transformation process. For instance, a large part of it falls back on the National University of Colombia (UNAL) which has a leadership conditions due to its institutional, academic and research features[10]. This strong leadership conditions are supported by history since, as it name indicates, it was the first university in the country funded by the government just 57 years after its independence from Spain. Since then, the UNAL has maintaining its leading position as the larger higher education institution of the country, with the higher coverage in the national territory and with the best academic standards. This statements will be supported in the following paragraph.

[10] UNAL, National University of Colombia, Global Development plan 2010-2012. "For a university of excellence, investigative, innovative and to the vanguard of the country" Bogotá, D.C. 2009, p.33

In order to respond to its social mission as "national university", the UNAL is decentralised in eight headquarters with the aim to guarantee a national coverage. For instance these headquarters are distributed along the national territory strengthening its presence in the country (Figure9). Some of this cities are major cities as the case of Bogotá and Medellin. However , since the goal is to strength its presence in the whole territory, the UNAL has established headquarters in medium size cities like Manizales and Pereira in a region well known as the Coffee-Growers Axis, San Andres Island in the Caribbean, Leticia in the Amazonas establishing presence in the frontier with Brazil, Arauca in the Orinoquía Region establishing presence in the frontier with Venezuela and Tumaco in the Pacific region.

Therefore, the coverage of the UNAL represents the 3,2% of the student population in higher education in Colombia accommodating in total 47.226 students (SINIES, 2009). Despite of the efforts the university has done to establish its presence in the country, this figure is only significant in the larger cities. This condition is a result of the urbanization process, since the migration of people to big cities has reduced the opportunities for development and growing of small cities and rural areas. Therefore, the university wants to strength its regional character as one of the key institutional goals. Thus, the establishment of research institutes as small headquarters in frontiers regions is a first step to use education as factor for regional development.

Likewise the academic reputation of the UNAL is supported by the fact of being the university with most academic programmes in graduate and postgraduate programmes; 395 in total which represents the 6,4% of the total programmes supplied in the country (SINIES, 2008 and SIA[11], 2008). For instance, 259 of the 395 programmes are offered only in Bogotá which positions this headquarters, well known as the University City, as leader in academic coverage at national level. Likewise, the UNAL is head in research activities since 301 of the 395 programmes are postgraduate programmes. It means that the UNAL covers 7,1% of the postgraduate programmes in Colombia (SINIES, 2008 and SIA, 2008). Therefore, in order to have a clear overview of the academic relevance of the UNAL and the Bogotá headquarters in the national context this figures are summarised in Figure 10 as follows.

[11] SIA is the academic information system of the National University of Colombia

Figure10. Academic coverage of National University of Colombia and Bogotá headquarters in the country. Source: SINIES, 2008 and SIA, 2008

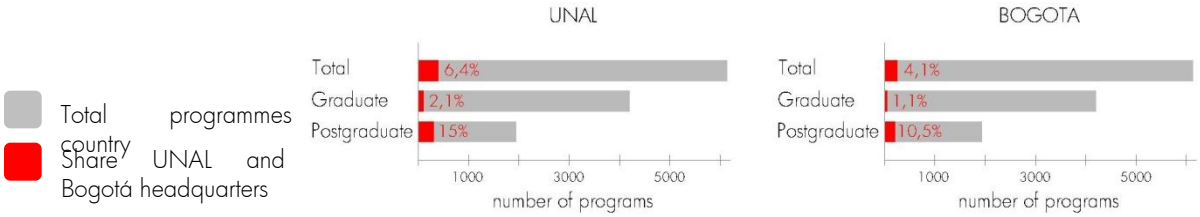
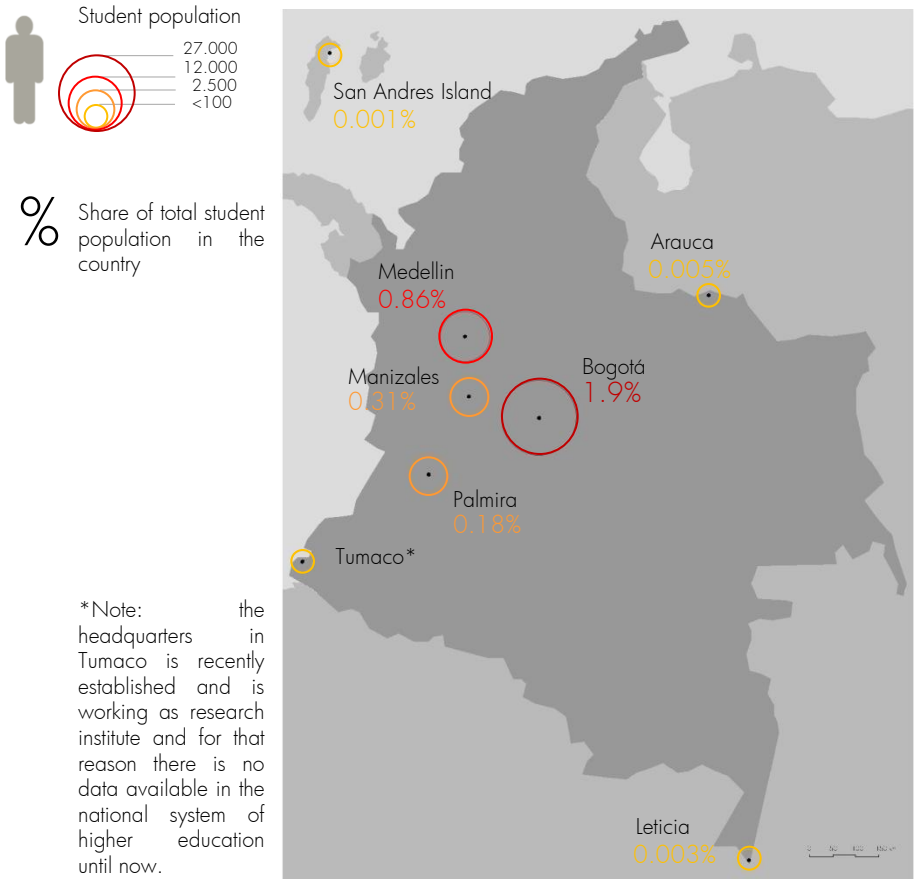


Figure9. Coverage National University of Colombia in the country. Source: SINIES, 2009



*Note: the headquarters in Tumaco is recently established and is working as research institute and for that reason there is no data available in the national system of higher education until now.

Appendix III. Interviews University City's stakeholders

INTERVIEW 1
Bogotá D.C., March 01, 2010

Respondent: Fernando Viviescas Monsalve
Background: Architect, National University of Colombia, Medellin; Master of Arts in Development and urban demography, Institute of Latin American Studies (ILAS), - University of Texas at Austin; Specialisation in Popular Housing, Institute for Housing Studies Rotterdam, The Netherlands
Relevant Experience for this research: Former Vice-rector National University of Colombia, Bogotá headquarters; Director Regularization and Management Plan of National University of Colombia, Bogotá headquarters; Director Regularization and Management Plan of La Salle University, Bogotá; Former Dean of Faculty of Architecture, National University of Colombia, Bogotá headquarters
Contact Info:
fernandoviviescas@cable.net.co
(+57)1 6366103
(+57) 315 3582673

Content:

1. Do you think that the physical campus in a university is seen as another resource to reach the institutional visions and goals, such as de development of the education and the positioning of the university among others?
It depends on the university and its campus development. For example, the case of the University City of Bogotá is one of the best examples in Colombia where campus is seen as an exclusive place for education. Since its creation the campus of the University City was planned and has been maintained as an isolated place in the city for the development of intellectual activities and independent political attitudes (see Fritz Karsen plan). On the contrary, most of the private universities which physical development has been the result of occupying vacant space in the city and merging academic spaces with other existent functions in the areas occupied. For instance, this kind of physical campus development is not negative in all the cases. Few universities have managed quite well their developments permitting a successful integration with the city that do not threat the development of the education (e.g. Andes, Javeriana). However, most of them (specially "garage universities") have a negative impact due to the low quality of the universities' physical resources which derives in a low quality of their surroundings since they attract low quality functions.
In this sense, it can be said that the quality of the physical resources is a essential part of the quality of the pedagogy, and it completely depends on each university and its campus development.

2. Accordingly, the regularization and management plan (PRM) besides of being an urban planning mechanism to integrate universities with the urban territory, is it respond to institutional goals?
No, the PRM is only a guideline defining occupation and use of the land and is not guided by particular interest on education. However, the diagnosis included in this plan helped to recognize the spatial quality and conditions of the campus. Nonetheless, in Colombia there is a disregard about the role of the spatial quality supporting the quality of the education.

3. According to your experience as vice-rector of the most important public university of Colombia and now as city planner developing a regularization and management plan for a private university, do you think that the decision making-process involving the acquisition, management and disposal of property differs in great manner between public and private universities?
Yes. Public universities have a capital below the standards and its investment capacity is reduced compared with private universities. However, public universities such us National University of Colombia has a potential in its physical campus which valuable land is a hidden capital that can ensure a large indebtedness capacity. However, there is a lack of experience from university managers to use this potential. But, the main difference with the private universities is the conservative attitude of public universities, which historical dependence of the government has limited the improvement of their financial management.

4. Do you think the real estate policy established by universities facilitates or makes difficult the implementation of their plans? How was your experience as Vice-rector of the University City?
The national University as well as other private universities has autonomy regarding to the management of their property. Although the established policy does not consider a development spatial plan aligned to the institutional vision, is not the main impediment but the broad range of stakeholders involved regarding campus decisions. Nonetheless, the possibility to interact is not recognized among them. In one side, there is a lack of commitment from external parties as well as a conservative position from the university side.

5. There is a spatial plan formulated within the PRM. Is there any implementation plan that includes timing (short, mid and long term), investment costs and financial sources for this proposal?
Not included in the PRM. The PRM is just and instrument that defines the use and occupation of the land. However, the spatial proposal formulated in the plan could be the basis of future plans that integrates the physical, academic and financial dimensions. However, a well organized management and experience is need it and unfortunately not all universities count even with a planning office.

6. Which urban stakeholders are involved during the formulation of the PRM and which are their roles within the decision making process?
There is a long list of urban actors related with university campus developments. But instead play a role during the formulation of the plan, what the plan does is manifests the urban relationship between the universities and these actors. In other words, the PRM evidences the impact university has on specific area. For example the diagnosis of the University City of Bogotá has shown that the urban impact has an influence area of seven blocks. This impact has modified the functions in the surrounding area by introducing services the student community needs. However, there are no internal welfare policies that cover these student demands which bring more formal or informal stakeholders to the process.

7. What do you think of the possibility of sharing university physical resources with other urban actors? In your opinion, which is the main obstacle in public institutions?
University managers are aware of the potential their physical resources like auditorium, sport facilities, etc… However the isolated condition of campuses like the University City had not permitted the modernization of the university. This is consequence of three aspects: First, there is a difficulty of open the university due to security and safety demands. Second, there is a lack of internal organization among internal stakeholders. Finally, the conservative attitudes of university managers in exploit the existent resources.

8. During the formulation of the PRM for the University City, were others PRM's of surrounding facilities (such us the stadium and other universities) taken into account? Are this individual plans connected in some manner?
No. Each PRM responds to an individual requirement from the District Planning Secretary (SDP). However, they are connected in a broader level by following the established urban policy such as Strategic Plan of Bogotá (POT) and the Zonal Planning Units (UPZ)

9. Some studies have revealed that student accommodation is one of the elements with a biggest impact at urban level by influencing the real estate market and the use of the land. Why the student accommodation is not included within the PRM's? And what is the role of the universities in accommodate their students?
Accommodate the student population is not the mission of the Universities. Some universities such as National University of Colombia tried before but the results were negative since universities do not have the capacity and experience to attend such demands. However, universities could promote and even supervise a student accommodation supply in hands of companies with experience on that. This field had not been studied in Bogotá which has generated informal solutions in the real estate market. Your study could introduce a reflection on this topic in order to recognize this absence that for sure influences the quality of the education.

INTERVIEW 2
Bogotá D.C., March 02, 2010

Respondent: Julio Colmenares Montañez
Background: Civil Engineer , National University of Colombia, Bogotá; Master in Geotechnics, National University of Colombia, Bogotá; Master of Sciences in Soil Mechanics and Environmental Geotechnics, Imperial College of Science, Technology and Medicine. University of London, UK; PhD University of London, UK.
Relevant Experience for this research: Current Vice-rector National University of Colombia, Bogotá headquarters; Former Dean Faculty of Engineering, National University of Colombia, Bogotá headquarters
Contact Info: vicerecto_bog@unal.edu.co
(+57)1 3165000

Content:

1. You are one of the most important stakeholders in the campus decision making process. After two periods of physical changes in the campus made by architects who occupied the position you have now, what is your campus vision as vice-rector of the University City?
We are working hard to recovery the image and position of the university in the 30's which deserves the title of the "White City". In that time the campus was the most important space dedicated exclusively for intellectual activities and icon of the most representative buildings of the modern style in Colombia. We want to retake the idea of making emblematic architectonic spaces for education and this is a vision that involves the society as a whole since the "university City" is part of a collective memory and has a symbolic value not only in Bogotá but in the whole country. For instance these are the most important aspects to highlight: Transparency; Strengthening of postgraduate programmes; Improvement of physical infrastructure through better quality standards; and Modernization of physical space with the aim to change users' attitudes and increase sense of belonging.

2 Is there any established policy regarding to the acquisition, management and disposal of university's property (land and buildings)? Is it facilitating or impeding the implementation of university physical plans?
The university is autonomous in the management of their property. There are some specific rules such as the university can acquire till 50.000Ha. of new land per year. You can look for more information in the Decree 1210. However, the policy is not the impediment for implementation of plans. The obstacles are in one hand financial and in the other political. First, the university needs larger investments to carry out its vision which involves important changes in physical infrastructure. Accordingly, the annual budget is not enough to cover the demand a physical transformation implies. Second, the university responds to many political postures, in which the so-called "social return" is relevant in any decision regarding to the campus.

Then there is a conservative posture from the directors and managers who are afraid to take large risks involving public capital. However, this derives in a disregard about the opportunities involved when talking about large risk. There is a need of recognition about the strategic position of the Campus and its exploitation.

3. Within the "Vision 2017" that is part of the Development plan 2010-2012; one of the main objectives is to position the University City among the best universities of Latin-America and the Caribbean. In which way the physical campus is seen as a resource to reach this institutional goal?

Within the development plan we included large and important changes in the physical infrastructure as one of the seven purposes to reach this Vision 2017 and to constitute a modern university. These changes are visible on specific projects which belong to the following fundamental themes: Public space, Sport and cultural park, Renovation of buildings and Construction of new buildings. What we want is to draw up a horizon of specific actions to serve as guideline for future administrations.

4. Are there any strategic alliances between the university and other institutions with which it can be possible to share facilities?

There are potential projects in which the university can make strategic and specific alliances such as:

- The hospital: the university received in donation a hospital building few years ago. It needs large investments in financial terms but the return on this investment is measurable not only in financial terms but represents a benefit for the academy and the society in general. To make this project works, the university just acquired a new land besides this building in order to complete a project which is planned to be managed by specialized institutions from outside.
- Sport and cultural park and facilities: this project retakes an idea of Leopold Rother (architect who projects the campus) to build in the west border an area which exclusively use will be sport. To make this happen the project includes the renovation of the existent Stadium which is the second stadium in Bogotá and the construction of a new building that includes Olympic pools, gym and other sport fields. This project includes a large area of public space and open sport fields that have already began to construct.
- Tech-park: is a long term project to build up a satellite campus for research. It will be located in Marengo, the current satellite campus outside Bogotá urban area.
- Innovation ring Bogotá: is a project that involves an important area of the city where main business, corporate parks, tech-parks, the airport and the National Administrative Centre (CAN) is located. For instance, the strategic location of the University in this project represents an excellent opportunity to make alliances with other important institutions.

Health City (Hortua): is another important area for urban renovation in which thee Municipality is interested and the University possesses property that can be used with academic purposes as well as for society benefit like the San Juan de Dios Hospital.

INTERVIEW3
Bogotá D.C., March 03, 2010

Respondent: Guillermo Restrepo
Background: Architect, Los Andes University, Bogotá; Bachelor in Arts, Friends World College, New York
Relevant Experience for this research:
Current Director of Projects National University of Colombia, Bogotá headquarters; Professor Faculty of Architecture, National University of Colombia, Bogotá headquarters
Contact Info:
gullermoerre@gmail.com
(+57)1 3165000 Ext. 18317

Content:

1. What follows after the approbation of the PRM?
After the change of administration, several positions inside the university also changed. One of these positions included the Direction of projects which was in charge of the same director during two periods in which many spatial changes were done. When I took this position the first step was make an overview of all spatial interventions which design have origin in this office. For instance the quality of the design instruments used was evaluated such us a "Building Intervention Manual" which was developed in this office and implemented in any renovation but which use was not positive in all cases .
What we are doing now is using the PRM as basis and guideline for the development of projects but evaluating the previous proposals that had not been constructed yet in order to align them with higher institutional vision by making of them projects of high quality standards as well as feasible. In that sense we recognized that not every single project have to be developed in this office.

2. Which new developments associated with the improvement of physical infrastructure are planned or are in construction right now?
There are different projects which development priority depends on the support of their faculties. However, according to their scale level we decided to split the list in two kinds of projects. The first ones are large projects (all new buildings and architectural icons) which design requires specialized consultancy that can not be supplied by this office such as:
•Laboratory Building (International invited competition is planned)
•Inter-Faculties Building for PhD (National open competition is planned)
•Faculty of Architecture Building (National and International open competition is planned)
•The second ones are moderate and small projects that can be managed and/or designed in this office and include new buildings, renovations and public space:
•Sound and Image building for Film & TV programme (New buildings required by the Faculty of Arts)

•Canteens and Cafes (Change last proposal, renovation instead new buildings)
•Sport and Cultural park (that includes a new building)
•Faculty of Veterinary Science (new building)
•Faculty of Nursing (renovation)
•Archive (New building)
•ICTA – Agricultural Science and Technology Institute (Renovation now in progress)
•Scenic Arts (new building)
•University Hospital (renovation and new building)

3. How is the priority in developing the projects? Are there any implementation strategy that involves cost, time and financial resources of the proposals?
It depends on the promotion and support of the faculties. Nonetheless, some priority is given according to the users' needs and/or the financial resources available to develop some projects and this last is very reliant of the commitment level inside the faculties. When the project is developed here, we assign a cost indicator per square meter based in market prices without including furniture and special equipment (around €720/m2)

4. Are the Seismic Vulnerability studies taking place as was planned before?
All the renovations and new buildings have to fit the NSR-98 and for instance they need and structural diagnosis. The university wanted to make a complete Seismic vulnerability study for the whole campus but it results an ambitious and expensive project. For that reason, is included in line with the developments.

INTERVIEW 4
Bogotá D.C., March 05, 2010

Respondent: Nelson Lugo Torres
Background: System Engineer, national University of Colombia, Bogotá; Master in Urbanism, National University of Colombia
Relevant Experience for this research: Current Director Institutional and Territorial Planning Office, National University of Colombia, Bogotá headquarters (during three consecutive periods)
Contact Info:
ofiplane_bog@unal.edu.co
(+57)1 3165000 Ext. 18135

Content:

1. How is the campus decision making process organized within the institution? Who are involved in this process and what are their functions?
There is an Advisory committee of physical spaces (CAEF) delegated by the Headquarters Council to take and evaluate any decisions concerning the physical infrastructure. This CAEF is integrated by the Vice-rector (head of the board), three Deans (Faculties of Arts, Engineering and Economic Sciences), the Director of the Institutional and planning office, the Director of the Management Office, the Director of Maintenance of physical resources office and two invited which are assessors of the Vice-rector. This committee meets every eight days to discuss proposals (made by faculties or the Project group), to evaluate the progress of the physical interventions and to negotiate and promote them. The head of the committee (Vice-rector) counts with three Advisory offices: Secretary, Legal and Planning office. The last one provides specific spatial advice and counts with a Technical Committee integrated by architects, engineers and specialized professionals who study the spatial and technical feasibility of the proposals. Finally, this technical committee approves or denies the proposal and the CAEF take a final decision which is informed to the Headquarters Council. Most of the time, and when the proposals involves large and important developments this decisions approved by the Headquarters Council have to be informed to the Superior University Council which is the mayor authority of the institution and is integrated by the Rector of national University of Colombia, the Minister of Education of Colombia and other members delegated by the President and other boards.

2. Accordingly, there many internal stakeholders involved in the decision making process. What do you think is the priority of values among this: financial, institutional, functional or technical value?
In the decision making process there is always a balance between these values. It also depends on the specific project and its source. Sometimes, when there is a large project where political interests matter, the institutional value is priority.

Of course all physical interventions respond to an academic demand, where the functional value is the origin of the proposals. However, the supply of these needs has to be feasible in technical and economic terms. In this sense, all the values you mentioned have to be balanced in the process.

3. Is there any established real estate policy guiding the acquisition, intervention and disposition of physical resources inside the campus?
Yes. For any intervention we are taking as basis the Agreement 025 of 2005 by which the PRM is adopted. Besides this, we adopted the Resolution No.2809 of 2006 by which the processes to allocate, adequate and control physical spaces in the University City are regulated as well as the execution of physical interventions.

4. Within the "Vision 2017" that is part of the Development plan 2010-2012; one of the main objectives is to position the University City among the best universities of Latin-America and the Caribbean. In which way the physical campus is seen as a resource to reach this institutional goal?
Yes. The physical resource is absolutely a fundamental element to carry out this vision. There are two intended strategies related with physical infrastructure. The first one is "Updating the campus" and has the objective of improve the spatial conditions according to specific academic needs within the same amount of square meters. The second one is "Campus extension" which supports the intended academic growth by building new square meters for research and academic space. Both strategies counts with specific interventions that follow the urban guidelines established in the PRM as well as other architectural, structural and environmental regulations such us NSR-98 to mention one of them.

5. Are the university plans taking into account future scenarios that involve changes in spatial demands? (E.g. increase of student population, new ICT developments and decrease of financial resources from the government).
The university has estimated an increase in student population due to the new postgraduate programmes. We expect a growth of new 10.000 students in master and PhD programmes but maintaining the same population in bachelor programmes (around 30.000 students). Nowadays the University City counts with an area of 205.000m2 for academic use with an index of 6.5m2 per student. For instance and doing a row appreciation we need at least new 65.000m2 of academic space to supply the academic demands. Furthermore, the university is updating their infrastructure according to the new ICT developments. In fact, there is a plan to renovate and extend the informatics network to cover all student and office needs. Nowadays, we count with an index of 2380 computers per student and 1730 computers per staff. However, this index needs to be improved and updated to better quality standards. Moreover, new spatial developments such as the new laboratory building are planned with the objective to reach high tech standards for research requirements.

In the other hand, the financial resources from the government still being the same, but the investment in physical resources does not. The campus managers are aware of this situation, since the investment in physical resources is not considered in this amount the government assign for university autonomous use. In this sense, the university needs to recognise a need of finding alternative financial support from internal or external parties to invest in infrastructure.

6. Is there any implementation plan that involves the projects, stage for implementation, investment costs and financial sources?
There is a list of projects with a schedule and stage of implementation. The costs are approximated and the financial sources are specified but need to be promoted by specific faculties or institutes. This list can be use as guideline but is not definitive.

7. How is the maintenance process of the campus property? Is there any periodic evaluation of the buildings' conditions (Safe & healthy, Aesthetics, Technical)?
The maintenance works in this university needs to be restructured. The maintenance is emergent. There is a group of people responding to emergent situations such as locative repairs but they are not monitoring the technical conditions of the building.

8. Has the university consider in outsourcing this service?
Yes. There is not an explicit proposal. However, there are some barriers that do not permit this change that easily. Since socio-political groups inside the university has a strong presence in this office specially. Nonetheless, we are looking for a suitable model to adapt in this situation that benefits the institutional objectives as well as the university community instead maintaining that permanent conservative position the university has got used to.

9. Is there knowledge about the market value of the campus' properties?
Yes. There is a document carried out in 2007 for this office that contain all the information related with the properties, legal status, inventory, etc..

10. Are there any index of operational cost per square meter?
No, but there is a document with information about operational cost per year. Consult "Budgetary Situation 1993 – 2008, projection 2012" document.

Appendix IV. UCB's Portfolio analysis data

1 PORTFOLIO UNAL-BOGOTA UNIVERSITY CITY

	BUILDING GENERAL INFORMATION				PORTFOLIO VALUE								
					SYMBOLIC				ECONOMIC	TECHNICAL		FUNCTIONAL	
	CODE	BUILDING NAME	YEAR	AREA M2	PERCEIVED IMAGE	BUILDING USE RELEVANCE	LOCATION ACCESSIBILITY	URBAN INTEGRATION	VALUATION per M2	BUILDING AGE	CONSERVATION STATUS	FLEXIBILITY-FLOOR PLAN	AVAILABILITY SHARE ROOMS
1	101	Nursing faculty	1969	9,837.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 677.00	41	3	4	2
2	102	Central library	2009	10,641.0	5	Facility	<10min P.Trans	Metropolitan centre	€ 573.00	1	5	N.A.	5
3	103	Sport centre	1969	6,887.0	4	Facility	<10min P.Trans	Metropolitan centre	€ 299.00	41	3	5	N.A.
4	104	Leon de Greiff Auditorium	1969	6,470.0	5	Facility	<10min P.Trans	Metropolitan centre	€ 573.00	41	N.A.	N.A.	5
5	201	Law Faculty	1938	3,583.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 496.00	72	N.A.	4	3
6	205	Sociology-Human Sc. Faculty	1964	3,672.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 534.00	46	N.A.	1	5
7	207	Architecture Museum	1948	1,385.0	5	Facility	<10min P.Trans	Metropolitan centre	€ 458.00	62	N.A.	5	3
8	217	Graphic design- Arts Faculty	1943	4,131.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 178.00	67	3	4	4
9	210	Odontology Faculty	1952	3,942.0	3	Academic & Research, Administrative	<10min P.Trans	Metropolitan centre	€ 469.00	58	3	4	3
10	211	Odontology Restaurant	2000	87.0	3	Welfare services	<10min P.Trans	Metropolitan centre	€ 293.00	10	5	N.A.	N.A.
11	212	Classrooms 'Human Sciences	1969	5,913.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 276.00	41	3	4	4
12	213	Campus Restaurant	2002	1,139.0	4	Welfare services	<10min P.Trans	Metropolitan centre	€ 435.00	8	4	N.A.	N.A.
13	214	Antonio Nariño - Fac. Engineering	1941	2,853.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 98.00	69	2	4	1
14	224	Manuel Ancizar - interfaculty	1969	13,638.0	3	Academic & Research, Administrative	<10min P.Trans	Metropolitan centre	€ 207.00	41	3	4	3
15	225	Postgraduates Human sciences	1999	9,000.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 382.00	11	N.A.	4	5
16	229	Foreign Languages	1939	577.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 382.00	71	N.A.	4	1
17	230	Popular Bank	1962	276.0	3	Services T (functional)	<10min P.Trans	Metropolitan centre	€ 179.00	48	3	No data	N.A.
18	231	Foreign Languages II	1939	577.0	5	Academic, Administrative	<10min P.Trans	<10min P.Trans	€ 382.00	71	N.A.	4	1
19	235	Caretaker's room 26th Av.	1938	32.0	5	Services TJ (support function)	<10min P.Trans	Metropolitan centre	€ 191.00	72	N.A.	N.A.	N.A.
20	236	26th Av. Power Plant	1938	32.0	5	Services TJII (infrastructure)	<10min P.Trans	Metropolitan centre	€ 191.00	72	N.A.	N.A.	N.A.
21	238	Accounting - Economy Faculty	1939	947.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 382.00	71	N.A.	2	1
22	239	Philosophy - Social Sc. Faculty	1939	410.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 382.00	71	N.A.	2	1
23	251	Chapel	1953	251.0	4	Facility	<10min P.Trans	Metropolitan centre	€ 136.00	57	3	N.A.	N.A.
24	252	Caretaker's room north chapel	1968	22.0	2	Services TJ (support function)	<10min P.Trans	Metropolitan centre	€ 136.00	42	3	N.A.	N.A.
25	253	Caretaker's room south chapel	1968	6.0	2	Services TJ (support function)	<10min P.Trans	Metropolitan centre	€ 136.00	42	3	N.A.	N.A.
26	301	Beaux Arts -Arts Faculty	1940	2,595.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 496.00	70	N.A.	5	2
27	303	Architecture faculty	1969	13,029.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 243.00	41	2	5	5
28	304	Snack bar	1996	53.0	3	Welfare services	<10min P.Trans	Metropolitan centre	€ 227.00	14	3	N.A.	N.A.
29	305	Conservatory of music	1969	3,672.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 243.00	41	3	4	4
30	309	Construction works	1970	200.0	2	Research, Administrative	<10min P.Trans	Metropolitan centre	€ 124.00	40	3	4	1
31	310	Economy faculty	1961	4,020.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 534.00	49	N.A.	1	5
32	311	Economy faculty Phase II	2001	3,500.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 513.00	9	5	5	4
33	314	SINDU	1953	3,534.0	4	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 190.00	57	3	4	2
34	317	Art Museum	1973	317.0	4	Facility	<10min P.Trans	Metropolitan centre	€ 289.00	37	3	5	3
35	317-A	Art Museum	1987	400.0	4	Facility	<10min P.Trans	Metropolitan centre	€ 277.00	23	2	N.A.	3
36	401	Engineering Faculty	1943	5,393.0	5	Academic, Administrative	<10min P.Trans	Metropolitan centre	€ 496.00	67	N.A.	5	3
37	403	Snack bar	1996	53.0	3	Welfare services	<10min P.Trans	Metropolitan centre	€ 227.00	14	3	N.A.	N.A.
38	404	Maths & Physics Faculty	1947	5,690.0	4	Academic & Research, Administrative	<10min P.Trans	Metropolitan centre	€ 128.00	63	3	5	1
39	404	Maths restaurant	2000	275.0	3	Welfare services	<10min P.Trans	Metropolitan centre	€ 545.00	10	5	N.A.	N.A.
40	405	Maths & Physics Postgraduates	1993	3,086.0	3	Academic & Research	<10min P.Trans	Metropolitan centre	€ 336.00	17	3	3	1
41	406	Materials Laboratory	1942	4,995.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 534.00	68	N.A.	4	1
42	407	Materials postgraduates	1992	1,735.0	4	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 302.00	18	3	4	1
43	408	Hydraulic testing Laboratory	1954	3,113.0	4	Research	<10min P.Trans	Metropolitan centre	€ 171.00	56	3	5	1
44	409	Hydraulic Laboratory	1946	2,045.0	4	Academic & Research	10 – 20 min P.Trans	Metropolitan centre	€ 206.00	64	3	5	2
45	410	Models works	1969	2,063.0	3	Research	10 – 20 min P.Trans	Metropolitan centre	€ 80.00	41	3	N.A.	N.A.
46	411	Mechanic & electric Eng. Lab	1968	4,116.0	4	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 624.00	42	3	5	1
47	412	Chemical Engineer Lab.	1982	2,232.0	3	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 272.00	28	3	5	1
48	413	Astronomic observatory	1945	269.0	4	Academic, Administrative	20-30 min P.Trans	Metropolitan centre	€ 124.00	65	3	1	1
49	413	Astronomic observatory Phase II	2002	300.0	4	Academic, Administrative	20-30 min P.Trans	Metropolitan centre	€ 468.00	8	5	1	1
50	414	Service room Tennis fields 2.3.4	1972	37.0	2	Services TJ (support function)	20-30 min P.Trans	Metropolitan centre	€ 95.00	38	3	N.A.	N.A.
51	421	Biology Faculty	1950	4,927.0	3	Academic & Research, Administrative	20-30 min P.Trans	Metropolitan centre	€ 134.00	60	3	5	3
52	425	Natural Science Institute	1971	4,708.0	3	Academic & Research, Administrative	20-30 min P.Trans	Metropolitan centre	€ 252.00	39	3	5	1
53	425	Natural Science Institute	1988	840.0	3	Academic & Research, Administrative	20-30 min P.Trans	Metropolitan centre	€ 236.00	22	3	5	1
54	426	Genetic Institute	1993	2,920.0	3	Academic & Research, Administrative	20-30 min P.Trans	Metropolitan centre	€ 395.00	17	4	2	3
55	427	ICN Power Plant	2005	18.0	2	Services TJII (infrastructure)	20-30 min P.Trans	Metropolitan centre	€ 763.00	5	5	N.A.	N.A.
56	431	IPARM High school	1960	2,758.0	3	Academic, Administrative	20-30 min P.Trans	Metropolitan centre	€ 116.00	50	3	2	3
57	432	Recreo Program	1960	431.0	1	Administrative	20-30 min P.Trans	Metropolitan centre	€ 100.00	50	3	2	N.A.
58	433	Storehouse & Printing	1960	1,386.0	2	Services TJI (Internal Operation)	20-30 min P.Trans	Metropolitan centre	€ 121.00	50	3	5	N.A.
59	434	IPARM old school	1967	680.0	2	Welfare Services	20-30 min P.Trans	Metropolitan centre	€ 100.00	43	3	1	N.A.
60	434	IPARM Phase II	2001	132.0	2	Welfare Services	20-30 min P.Trans	Metropolitan centre	€ 413.00	9	5	1	N.A.
61	435	Maintenance workroom	1950	686.0	1	Services TJI (Internal Operation)	20-30 min P.Trans	Metropolitan centre	€ 80.00	60	3	2	N.A.
62	436	Motor-vehicle park	1978	610.0	1	Services TJI (Internal Operation)	20-30 min P.Trans	Metropolitan centre	€ 165.00	32	3	N.A.	N.A.
63	437	Solid Waste collection	2000	160.0	3	Services TJII (infrastructure)	20-30 min P.Trans	Metropolitan centre	€ 495.00	10	4	N.A.	N.A.
64	438	Maintenance workroom	1999	393.0	3	Services TJI (Internal Operation)	20-30 min P.Trans	Metropolitan centre	€ 210.00	11	2	2	N.A.
65	450	Pharmacy - Science faculty	1979	4,504.0	4	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 282.00	31	3	4	2
66	451	Chemistry - Science Faculty	1947	11,065.0	4	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 211.00	63	3	5	3
67	452	Chemistry Postgraduates	1991	1,315.0	3	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 340.00	19	3	5	3
68	453	Classrooms 'engineering faculty	1969	5,075.0	4	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 286.00	41	3	4	5
69	454	Science & Technology library	2008	8,607.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 1,180.00	2	5	5	3
70	455	CADE Engineering Faculty	2010	1,423.0	5	Administrative	<10min P.Trans	Metropolitan centre	€ 669.00	0	5	5	N.A.
71	471	Medicine faculty	1954	15,750.0	4	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 254.00	56	3	5	5
72	472	Medicine Power plant	1968	100.0	1	Services TJII (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 65.00	42	2	N.A.	N.A.
73	473	Animals house	1988	288.0	1	Research	10 – 20 min P.Trans	Metropolitan centre	€ 132.00	22	2	N.A.	N.A.
74	474	Medicine Restaurant	1999	269.0	3	Welfare services	10 – 20 min P.Trans	Metropolitan centre	€ 310.00	11	4	N.A.	N.A.
75	475	Deposit	1973	20.0	1	Services TJI (Internal Operation)	10 – 20 min P.Trans	Metropolitan centre	€ 72.00	37	3	N.A.	N.A.
76	476	Sciences Faculty	1937	1,231.0	5	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 458.00	73	N.A.	1	2
77	477	Informatics Academic services	1963	495.0	3	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 192.00	47	3	5	1
78	478	Humboldt power plant	2005	30.0	3	Services TJII (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 369.00	5	5	N.A.	N.A.
79	479	El recreo Restaurant	1973	66.0	1	Welfare services	10 – 20 min P.Trans	Metropolitan centre	€ 108.00	37	3	N.A.	N.A.
80	480	CEMU - Medicine faculty	1955	240.0	3	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 151.00	55	3	1	N.A.
81	481	Veterinary medicine faculty	1938	1,576.0	5	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 420.00	72	N.A.	2	1
82	490	Observatory Power Plant	2005	23.0	2	Services TJII (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 1,328.00	5	5	N.A.	N.A.
83	495	Service room Tennis field 1	1972	37.0	2	Services TJ (support function)	20-30 min P.Trans	Metropolitan centre	€ 95.00	38	3	N.A.	N.A.
84	500	Agronomy faculty	1969	9,062.0	4	Academic & Research, Administrative	<10min P.Trans	Metropolitan centre	€ 276.00	41	3	4	3
85	500-A	ICTA - milk vegetables plant	1968	1,342.0	3	Research, Administrative	<10min P.Trans	Metropolitan centre	€ 216.00	42	3	3	1
86	500-B	ICTA - Meat plant	1968	2,184.0	2	Research, Administrative	<10min P.Trans	Metropolitan centre	€ 228.00	42	3	4	1
87	500-C	ICTA - Quality control lab.	1968	126.0	3	Research, Administrative	<10min P.Trans	Metropolitan centre	€ 205.00	42	3	1	1
88	500-D	ICTA - Supermarket	1968	249.0	2	Academic & Research, Administrative	<10min P.Trans	Metropolitan centre	€ 295.00	42	5	2	N.A.
89	500-E	Machinery deposit	1981	148.0	1	Services TJI (Internal Operation)	10 – 20 min P.Trans	Metropolitan centre	€ 146.00	29	3	N.A.	N.A.
90	500-G	Deposit and offices agronomy	1981	221.0	2	Services TJI (Internal Operation)	10 – 20 min P.Trans	Metropolitan centre	€ 170.00	29	3	N.A.	N.A.
91	501	Big animals clinic	1938	396.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 420.00	72	N.A.	1	N.A.
92	502	Histopathology classrooms	1938	518.0	5	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	2	1
93	503	Microbiology	1963	2,135.0	2	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 98.00	47	2	2	3
94	504	Avian pathology	1938	347.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	1	1
95	505	Fertilization laboratory	1938	747.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	2	1
96	506	Pathology laboratory	1938	797.0	5	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	2	1
97	507	Small animals clinic	1969	1,015.0	3	Academic & Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 184.00	41	3	1	N.A.
98	508	Veterinary medicine offices	1938	125.0	5	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	1	1
99	510	Veterinary classrooms	1938	335.0	5	Academic, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 343.00	72	N.A.	1	1

1 PORTFOLIO UNALBOGOTA UNIVERSITY CITY

	BUILDING GENERAL INFORMATION				PORTFOLIO VALUE								
					SYMBOLIC				ECONOMIC	TECHNICAL		FUNCTIONAL	
	CODE	BUILDING NAME	YEAR	AREA M2	PERCEIVED IMAGE	BUILDING USE RELEVANCE	LOCATION ACCESSIBILITY	URBAN INTEGRATION	VALUATION per M2	BUILDING AGE	CONSERVATION STATUS	FLEXIBILITY-FLOOR PLAN	AVAILABILITY SHARE ROOMS
100	531-7	Comodatum ICA	1961	3,726.0	3	Research, Administrative	<10min P.Trans	<10min P.Trans	No data	49	No data	No data	N.A.
101	561-A	Animal reproduction	1952	528.0	3	Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 143.00	58	3	4	N.A.
102	561-B	Postgraduates Animal reproduction	1950	2,100.0	4	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 270.00	60	4	4	1
103	561-C	Animal laboratory & Stables	1950	650.0	3	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 234.00	60	4	3	1
104	561-D	Animal behaviour	1952	330.0	3	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 234.00	58	5		
105	561-E	Poultry research	1992	700.0	3	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 257.00	18	3	2	1
106	561-F	Animal laboratory & experiments	1991	240.0	3	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 226.00	19	3	2	1
107	561-G	Unibiblos	1979	680.0	1	Services T-I (support function)	10 – 20 min P.Trans	Metropolitan centre	€ 199.00	31	3	4	N.A.
108	561-H	Deposit Unibiblos	1977	220.0	2	Services T-II (Internal Operation)	10 – 20 min P.Trans	Metropolitan centre	€ 161.00	33	3	4	N.A.
109	561-I	Cinerator	2000	25.0	2	Services T-III (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 404.00	10	5	N.A.	N.A.
110	561-J	Power plant	2005	15.0	3	Services T-III (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 768.00	5	5	N.A.	N.A.
111	561-K	Caretaker's room veterinary	1977	27.0	1	Services T-I (support function)	10 – 20 min P.Trans	Metropolitan centre	€ 60.00	33	2	N.A.	N.A.
112	571	Newspaper library	1985	8,830.0	4	Facility	<10min P.Trans	Metropolitan centre	€ 324.00	25	4	5	4
113	571-A	Caretaker's room newspaper lib.	1985	12.0	4	Services T-I (support function)	<10min P.Trans	Metropolitan centre	€ 162.00	25	3	N.A.	N.A.
114	601	Power Plan 45th St.	1938	59.0	5	Services T-III (infrastructure)	<10min P.Trans	Metropolitan centre	€ 305.00	72	N.A.	N.A.	N.A.
115	603	Caretaker's room 45th St.	1938	59.0	5	Services T-I (support function)	<10min P.Trans	Metropolitan centre	€ 382.00	72	N.A.	N.A.	N.A.
116	606	Comodatum IICA CIRA	1963	2,651.0	3	Research, Administrative	<10min P.Trans	Metropolitan centre	No data	47	No data	No data	N.A.
117	608	Computer centre	1964	906.0	3	Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 186.00	46	3	1	N.A.
118	610	Comodatum CIAF	1969	3,957.0	3	Research, Administrative	<10min P.Trans	Metropolitan centre	No data	41	No data	No data	N.A.
119	614	Telephone exchange	1968	202.0	3	Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 158.00	42	3	No data	N.A.
120	615	Comodatum INGEOMINAS	1944	506.0	4	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	No data	66	No data	5	N.A.
121	621	Comodatum IGAC	1952	21,361.0	4	Research, Administrative	<10min P.Trans	Metropolitan centre	No data	58	No data	No data	N.A.
122	631	Comodatum INGEOMINAS	1958	5,432.0	3	Research, Administrative	10 – 20 min P.Trans	Metropolitan centre	No data	52	No data	No data	N.A.
123	632	Liquid Waste collection	1963	322.0	1	Services T-III (infrastructure)	20-30 min P.Trans	Metropolitan centre	€ 125.00	47	3	N.A.	N.A.
124	633	Landfill simulator	1988	90.0	1	Research	10 – 20 min P.Trans	Metropolitan centre	€ 185.00	22	3	N.A.	N.A.
125	700	Caretaker's room 38th St.	1993	40.0	3	Services T-I (support function)	10 – 20 min P.Trans	Metropolitan centre	€ 201.00	17	3	N.A.	N.A.
126	701	Film & television- arts faculty	1938	1,989.0	5	Academic, Administrative	20-30 min P.Trans	Metropolitan centre	€ 416.00	72	N.A.	5	1
127	731	Alfonso Lopez Stadium	1937	23,730.0	5	Facility	20-30 min P.Trans	Metropolitan centre	€ 534.00	73	N.A.	N.A.	N.A.
128	761	Acoustic Shell	1937	3,849.0	3	Facility	20-30 min P.Trans	Metropolitan centre	€ 120.00	73	3	1	N.A.
129	901	Caretaker's room 53th Av.	1990	36.0	2	Services T-I (support function)	20-30 min P.Trans	Metropolitan centre	€ 218.00	20	3	N.A.	N.A.
130	905	Child care centre	2006	1,397.0	4	Welfare Services	20-30 min P.Trans	Metropolitan centre	€ 1,041.00	4	5	No data	N.A.
131	910	Comodatum ICONTEC	1977	3,092.0	3	Research, Administrative	20-30 min P.Trans	Metropolitan centre	No data	33	No data	No data	N.A.
131	**TOTAL GFA CAMPUS**			**333,301.0**									
	TOTAL LAND AREA CAMPUS			**1,207,657.0**					€ 262.00				

2 PORTFOLIO UNALBOGOTA IN URBAN LAND

	BUILDING GENERAL INFORMATION				PORTFOLIO VALUE								
					SYMBOLIC				ECONOMIC	TECHNICAL		FUNCTIONAL	
	CODE	BUILDING NAME	YEAR	AREA M2	PERCEIVED IMAGE	BUILDING USE RELEVANCE	LOCATION ACCESSIBILITY	URBAN INTEGRATION	VALUATION per M2	BUILDING AGE	CONSERVATION STATUS	FLEXIBILITY-FLOOR PLAN	AVAILABILITY SHARE ROOMS
	ADMINISTRATIVE UNITS												
1	860	Caretaker's room Unit 1	1987	7.0	3	Services T-I (support function)	10 – 20 min P.Trans	Metropolitan centre	€ 158.00	23	3	N.A.	N.A.
2	861	Uriel Gutierrez Unit 1	1963	13,355.0	4	Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 280.00	47	3	5	5
3	862	Camilo Torres Unit 2	1968	13,013.0	3	Administrative	10 – 20 min P.Trans	Metropolitan centre	€ 269.00	42	3	2	N.A.
4	863	Waste deposit	2001	20.0	3	Services T-III (infrastructure)	10 – 20 min P.Trans	Metropolitan centre	€ 358.00	9	4	N.A.	N.A.
5	865	Caretaker's room Unit 2	1997	8.0	3	Services T-I (support function)	10 – 20 min P.Trans	Metropolitan centre	€ 207.00	13	5	N.A.	N.A.
	TOTAL GFA			26,403.0									
	TOTAL LAND AREA			55,433.0					€ 400.00				
	SANTA ROSA HOSPITAL UNIT												
6	916	Convention centre (unfinished)	1998	596.0	3	Unused	20-30 min P.Trans	Metropolitan centre	€ 100.00	12	2	No data	N.A.
7	921	Administrative unit	1961	2,214.0	3	Administrative	20-30 min P.Trans	Metropolitan centre	€ 187.00	49	3	No data	N.A.
8	926	Clinic	1961	18,371.0	3	Unused	20-30 min P.Trans	Metropolitan centre	€ 265.00	49	2	No data	N.A.
9	927	Emergency room	1968	1,488.0	3	Unused	20-30 min P.Trans	Metropolitan centre	€ 138.00	42	2	No data	N.A.
10	928	Deposit and workroom	1968	504.0	1	Services T-II (Internal Operation)	20-30 min P.Trans	Metropolitan centre	€ 27.00	42	2	No data	N.A.
	TOTAL GFA			23,173.0									
	TOTAL LAND AREA			18,510.0					€ 187.00				
	JORGE ELIECER GAITAN UNIT												
11	976	Gaitan Houses (10 buildings)	varied	2,375.0	3	Administrative - Extension	10 – 20 min P.Trans	Metropolitan centre	€ 943.00	varied	4	2	N.A.
22	976	Gaitan Museum House	1933	273.0	5	Facility	10 – 20 min P.Trans	Metropolitan centre	N.A.	77	N.A.	1	N.A.
23	976	Gaitan centre	1984	10,916.0	4	Unused	10 – 20 min P.Trans	Metropolitan centre	€ 353.00	26	2	4	N.A.
	TOTAL GFA			13,564.0									
	TOTAL LAND AREA			8,089.0					€ 304.00				
	OTHER BUILDINGS												
24	193	National Astronomic Observatory	1803	238.0	5	Facility	10 – 20 min P.Trans	Metropolitan centre	N.A.	207	3	N.A.	N.A.
	TOTAL LAND AREA			2,154.0					N.A.				
25	930	San Agustin monastery	1744	4,590.0	5	Facility	10 – 20 min P.Trans	Metropolitan centre	N.A.	266	1	N.A.	N.A.
	TOTAL LAND AREA			4,379.0					N.A.				
26	960	60th street's House	-	394.0	3	Administrative - Extension	20-30 min P.Trans	Metropolitan centre	€ 191.00	No data	3	No data	N.A.
	TOTAL LAND AREA			264.0					€ 70.00				
27	970	Las Nieves Building	1960	3,904.0	4	Administrative - Extension	<10min P.Trans	Metropolitan centre	€ 309.00	50	3	No data	N.A.
	TOTAL LAND AREA			488.0					€ 437.00				
27	**TOTAL GFA IN URBAN LAND**			**72,266.0**									
	TOTAL URBAN LAND AREA			**89,317.0**									

4 PORTFOLIO UNALBOGOTA IN RURAL LAND

	BUILDING GENERAL INFORMATION				PORTFOLIO VALUE								
					SYMBOLIC				ECONOMIC	TECHNICAL		FUNCTIONAL	
	CODE	BUILDING NAME	YEAR	AREA M2	PERCEIVED IMAGE	BUILDING USE RELEVANCE	LOCATION ACCESSIBILITY	URBAN INTEGRATION	VALUATION per M2	BUILDING AGE	CONSERVATION STATUS	FLEXIBILITY-FLOOR PLAN	AVAILABILITY SHARE ROOMS
28	950	Radio broadcast Station	1999	150.0	2	Services T-II (Internal Operation)	Only by car	Rural area	€ 314.00	11	3	N.A.	N.A.
	TOTAL LAND AREA			254.0					€ 6.00				
	199	La Esperanza Plot		none									
	TOTAL LAND AREA			12,051.0		Unused	Only by car	Rural area	€ 1,300.00			N.A.	N.A.
29-38	830	Marengo Unit (9 buildings)	1969	5,568.0	3	Academic & Research, Administrative	Only by car	Rural area	€ 130.00	41	3	N.A.	1
	TOTAL LAND AREA			950,000.0					€ 99.00				
38	**TOTAL GFA IN URBAN LAND**			**5,718.0**									
	TOTAL URBAN LAND AREA			**962,305.0**									

Appendix V. Physical infrastructure Projects UNAL, Bogotá headquarters

OFICINA DE PLANEACION INSTITUCIONAL Y DEL TERRITORIO
UNIVERSIDAD NACIONAL DE COLOMBIA - SEDE BOGOTA

	PROYECTO	AREA	GRAN TOTAL POR PROYECTO	PRIORIZACION					RECURSOS				
				AVANCE DE LA OBRA	COSTO DE LA OBRA	USO DEL PROYECTO (COMUN=2 O FACULTAD=1)	MEJORAMIENTO DEL CAMPUS (1-10) E IMPACTO EN LA COMUNIDAD	TOTAL PRIORIZACION	30% FACULTADES	PROYECTOS DE INVERSION (16,300 MILLONES)	70% CREDITO	TOTAL PROYECTO
1	INGENIERIA 401	5,452	16,120	18	1.60	1	5	26	2,983	1,853	11,284	16,120
2	ARCHIVO	2,200	6,508	18	0.60	2	4	25	1,204	748	4,556	6,508
3	ESPACIO PUBLICO	30,000	13,330	9	1.30	2	5	17	2,467	1,532	9,331	13,330
4	ENFERMERIA	8,351	24,683	11	2.40	1	4	18	4,568	2,837	17,278	24,683
5	DOCTORADO C.H. Y ECONOMICAS	6,000	18,159	7	1.80	1.5	5	15	3,361	2,087	12,711	18,159
6	VETERINARIA	6,354	18,785	9	1.80	1	4	16	3,476	2,159	13,150	18,785
7	LABORATORIOS	15,000	45,969	1	4.50	2	5	13	6,507	5,284	32,178	45,969
	PROYECTOS VIABLES DE ACUERDO AL PRESUPUESTO DISPONIBLE…								26,566	16,500	100,488	143,555
8	LABORATORIO DE IMAGEN Y SONIDO	3,000	8,874	4	0.80	1	5	11			6,212	8,874
9	CAFETERIAS	2,817	8,332	1	0.80	2	5	9			5,832	8,332
10	ARTES ESCÉNICAS	2,500	7,395	1	0.70	1	5	8			5,177	7,395
11	BUN		-	4	0.00	1	3	8			-	-
12	DERECHO	8,000	23,636	1	2.30	1	3	7			16,545	23,636
13	CENTRO JORGE ELIECER GAITAN	10,916	32,259	1	3.20	2	1	7			22,581	32,259
14	ARQUITECTURA	12,000	36,298	1	3.60	1	1	7			25,409	36,298
15	CLINICA ODONTOLÓGICA	866	2,563	4	0.20	1	1	6			1,794	2,563
16	LABORATORIO DE ROBOTICA (ÁREA DEL EDIFICIO DE HIDRÁULICA)	7,000	20,693	1	2.00	1	1	5			14,485	20,693
17	CLAUSTRO SAN AGUSTIN	4,590	13,573	1	1.30	1.5	1	5			9,501	13,573
18	E.I.	4,994	14,766	1	1.40	1	1	4			10,336	14,766
19	CERRAMIENTO CRA 30	640	240	1	0.02	2	1	4			168	240
20	CERRAMIENTO CALLE 53	457	173	1	0.01	2	1	4			121	173
	GRAN TOTAL POR RUBRO…	143,352	312,357								218,650	312,357

CUBRIMIENTO CON CREDITO DE 100,000 MILLONES ESTIMADOS

	PROYECTOS CON FINANCIACION PROPIA							
21	MARENGO	5,298	15,665	13	1.50	1.5	3	19
22	ROBERTO FRANCO	1,815	5,370	1	0.50	1.5	3	6
23	PARQUE DEPORTIVO	11,000	32,507	9	3.20	2	3	17

Feasible Projects covered with a loan

Source: Institutional and territory planning Office, UNAL, Bogotá headquarters, 2010.

Note: costs in millions appears in Colombian currency which is Colombian pesos. The data specified in the report is approximated and was converted to Euros by using today's currency exchange data.

Appendix VI. Quantitative impact on real estate decisions for the UCB

* Source: Geographic information system UCB (SIG) 2003 and Interview with Current Director of the Institutional and Territorial Planning Office

EXPECTED QUANTITATIVE POPULATION GROWTH*	# STUDENTS
Current students population	27,484.0
Expected additional students in 2014	24,392.0
Expected ddditional postgraduate students	10,000.0
TOTAL FUTURE STUDENTS POPULATION	61,876.0

** The future real estate supply uses this data as minimum required area for expansion of the portfolio

QUANTITATIVE SPATIAL DEMANDS	M2	EXTRA	FUTURE
Current GFA	333,301.0	417,075.0	750,376.0
Current area for academic purposes**	205,000.0	256,526.0	461,526.0
Index - M2 of GFA per student	12.1	0.0	12.1
Index - M2 of academic space per student	7.5	0.0	7.5

*** The index of construction, equipment and renovating costs per m2 are based on today's construction and refurbishment costs in Colombia converted at today's Euro currency. For the new supply, which is planned with high performance buildings, the construction costs increases €700 per m2 which is based on US benchmarks of high performance buildings in public institutions. Source: CONSTRUDATA-Colombia, 2009 and Minnesota Planning-Critical Issues, *Return on Investment of High Performance Buildings*, January 2002

COST HIGH PERFORMANCE BUILDINGS	PESOS (COL.)	EUROS
NEW SUPPLY COSTS		
Construction costs per m2***	$ 3,700,000.00	€ 1,521.00
Furniture and equipment per m2***	$ 1,000,000.00	€ 410.50
TOTAL	$ 4,700,000.00	€ 1,931.50

RENOVATION COSTS		
refurbishment costs per m2***	$ 2,500,000.00	€ 1,026.00
Furniture and equipment per m2	$ 1,000,000.00	€ 410.50
TOTAL	$ 3,500,000.00	€ 1,436.50

CURRENT INVESTMENTS ON UCB'S PORTFOLIO	
TOTAL COST CURRENT LIST OF PROJECTS	€ 128,228,000.00
TOTAL COST OF FEASIBLE PORJECTS	€ 58,849,600.00

FUTURE INVESTMENTS ON UCB'S PORTFOLIO		
ACTIONS	M2	COSTS
Renewal	218,379	€ 313,701,433.50
Consolidation	25,869	€ 37,160,818.50
Special maintenance	75,597	€ 108,595,090.50
TOTAL RENEWAL	319,845	€ 459,457,342.50
Reposition for disposal	12,089	€ 23,349,903.50
New space supply	223,500	€ 431,690,250.00
TOTAL NEW SUPPLY	235,589	€ 455,040,153.50
TOTAL	555,434	€ 914,497,496.00

Flavia Curvelo Magdaniel
Bleijenburg 8b • 2511 VD • The Hague
The Netherlands
+31624566676
F.T.D.J.CurveloMagdaniel@student.tudelft.nl
Corporate & public real estate management Laboratory