Mapping Urban Form
Morphology studies in the contemporary urban landscape

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Spatially, the city does no longer exist as a contained and bounded entity. The city grew discontinuous, and it dispersed in different forms across the territory. While some might think of this new entity as amorphous, this research looks particularly at the form of that expansion. I want to argue that rather than merely seeing the new additions and changes in opposition to the compact traditional developments, or only highlighting their absences in comparison to the traditional city, we need to investigate their particular spatial characteristics. Some authors argue, for example, that the open space, rather than the built one, is the binding element in the contemporary city. Others refer to the large block or the new centres that appear in relation to the infrastructure system. All these elements are located and placed following a specific logic that needs to be uncovered. The identification of that logic is the quest of this research.

The motivation is to identify the common spatial features and principles of location in the contemporary urban landscape in order to produce general knowledge about its form. In order to do this, it is first necessary to clarify the object of study, the contemporary urban landscape, in the frame of recent theories. For his purpose, the vocabulary that was developed mainly along the second half of the twentieth century to characterize the transformations of the city is reviewed. While some of the authors of the terms of the vocabulary claim that the essence of those transformations is not spatial, others disagree and argue that this also ignores the way the space of the city is affected. Furthermore, most of them recognize that the new information and communication technologies, globalization and individualization produce territorial transformations and rearrangements. This research coincides with these reflections since territorial transformations have occurred in the form and spatial configurations of the city and the understanding of those transformations is essential for the practice of urban design in that reality.

Within the existing literature, there are two significant lines of studies on urban form. The first corresponds to the tradition of morphological studies (which were influential particularly in the 1970s and 80s) and the second to more recent studies about the form of the landscape and the territory (which have been conducted since the 1990s). The first group of studies has already established a general knowledge about urban morphology. This knowledge is operative for engaging morphological studies of different urban areas. However, they have been mainly applied to historical traditional centres and as many authors have noted, this limits its applicability in the contemporary city which, as was mentioned before, shows different formal features than the traditional one. The second type of studies has developed an approach to study the form of the territory and the landscape supported with mapping. They emphasize the necessity of rigorous mapping of the existent condition before intervening in its particular spatiality. Their analysis is clearly intended for producing operational observations by recognizing the possibilities offered by mapping. However, these studies have been mainly applied in specific cases, particularly in south European urban territories. Therefore, they are less generally applicable than the traditional morphological studies.

Consequently, in order to study the morphology of the contemporary urban landscape, we need to extract general observations about its form from the recent studies, while simultaneously confronting knowledge from the traditional morphological approach with the recent transformations of the city, using the tools of mapping that the recent studies have developed. This is achieved through a critical review of both the traditional urban morphology studies as well as the recent mappings of the landscape and the territory. The approach for the review is developed from texts of map theory. Three main elements are observed in all the studies, the context of the mapmaker, the context of the map and the techniques and abstractions used to map. The main aims this review is to explore the possibilities of application, and to find generalization that can be extracted to map the form of the contemporary urban landscape.

From the existing studies, the main three schools of typo-morphology are reviewed. These are nowadays grouped in the International Seminar of Urban Form (ISUF), and they are British, French and Italian along with studies conducted in the Dutch context. In these reviews, the main objective is to identify the elements, scales and types of abstractions studied, and to see whether these allow application to contexts of the contemporary landscape. In general, the concepts of ‘plan units’, ‘tissue urbain’, ‘homogeneous areas’ and ‘fringe belt’ emerge as potentially applicable to any urban form.

The recent studies focus on understanding the essential characteristics of the studied areas not by mimesis of identification of the deficiencies in comparison to traditional urban forms, but by highlighting specific qualities and form of organization that relate more to the structure of the landscape, the open space and the infrastructure than to the built component. This understanding occurs through the process of mapping. The studied territories
are mapped with a very rigorous detail in order to describe their spatiality. Maps of different types of occupation of the territory, of processes of transformation and of different layers which are extracted from the more detailed maps are essential component of these studies. In relation to the operational character of mapping, many of these studies attempt a mapping of different scenarios for the future development of the studied areas. This accent given by these studies to mapping coincides with a common contemporary revival of mapping, as it is shown through the study of many recent published maps and atlases that have been reviewed as part of the context of the map.

After the literature review, the second part of the thesis develops through case studies. In these cases, the observations from the literature are applied in two different contexts which have different formal characteristics at the regional scale and different forms of planning, the Randstad in the Netherlands and the Bogotá-Sabana region in Colombia. These cases are necessary to test the findings from the review of existent studies and to understand the relation between generalizable aspects (which is why two very different regions are selected) and specific responses in the urban form of a specific context.

In the first place, areas based on the homogeneity of the street pattern are identified and studied in their internal logic, namely, in the terms of the main elements, parcel building and block. At this scale, different types of blocks and patterns are identified, from closed blocks bordered by buildings to large open blocks where the structure is given by the rural road system with the open space as the main element. The second aspect which is mapped for each area is the process of development and the relation to the surroundings or to the whole region. The observation of the whole region in terms of homogeneous areas shows the existence of layers composed by repetitions of the homogeneous areas across the territory. Because they relate similarly to the surroundings and existing infrastructure, these areas form layers. Next to the layers of homogeneous areas, special areas with a lack of homogeneity in the pattern emerge. The mapping of the larger scale with layers according to the different types of patterns shows how those areas without homogeneity locate in the overlapping of different layers. Collision between different layers generates those in-between areas that simultaneously form a layer in the territory.

The comparison between the two regions shows simultaneously commonalities and differences. At the level of the homogeneous areas we find similar patterns between both regions. However, the relation between each area and the surroundings is different. In the Randstad, there is a clear hierarchy of connection from the local scale towards an intermediate and a regional scale. In Bogotá, roads between homogeneous areas play roles at all scales. This is visible in the way new developments occur, in the Randstad a connection at the regional scale is necessary in every new development, while in Bogotá new developments connect to the surroundings only through local roads. This creates for the Randstad a disconnection at local scale while it creates for the Bogotá region a lack of a real regional connection. This is changing. Nowadays, the Bogotá region is overlapping a large scale network on top of the local street patterns of already built up areas.

At the end, the observations from the case studies are correlated back to those from the existing studies in order to make some insightful conclusions at the general level. The findings at the general level show that contemporary urban landscape can be understood as a structure formed by overlapping layers. Each layer is formed by areas of similar internal configuration which spread over the territory. The way those areas form a layer, is by means of the open space as new binding element and the large scale infrastructure. Repetitive forms dispersed in the territory which relate in similar ways to the infrastructure and surroundings form each layer. The overlapping of different layers creates in some cases collisions that we have identified as in-between areas, which are areas without identifiable pattern. These areas appear today as residual between homogeneous areas. For the future, they offer possibilities for design and development of a structure for the urban landscape at regional scale. They are located in the overlapping points of different scales and layers and combine inside residuals of all those areas in the surroundings. They can become the new regional centres, structuring elements at the regional scale where the binding element is the open space.

The traditional morphological approaches that concentrated mainly in understanding typical configurations particularly studied the internal logic of homogenous areas. This study shows that it is necessary to look at the relation between those areas. It is especially at the borders that the homogeneity breaks and where the structure at the regional scale is generated. At the borders, connections and collision between homogenous areas the structure at the regional scale is created.

Finally, it is the mapping process that allows us to understand territories as overlapping layers of different logics, revealing the location of leftover areas or in-between spaces. This approach facilitates the study of relations between different scales of observation of a site in the contemporary urban landscape. It shows the dependence between scales and the way the implications of smaller scales can be understood at the regional scale and vice versa.

Camila Pinzón Cortes, November 2009
This part introduces the problem and approach of the research, as well as the main elements and their theoretical framework.

The first chapter introduces the problem statement and main research questions. It goes on then to explain the aims of the research and it continues with the methodology. Finally, the last section of the chapter offers an overview of the outline of the whole thesis.

The second chapter presents the theoretical framework by shedding more light on the main components, urban form, mapping, and the contemporary urban landscape, as they are used in this research. In order to do this, the traditional urban morphological approach and the recent mapping of the landscape and the territory are introduced. Finally, the contemporary urban landscape is introduced through the terminology which has been developed to name it.
Chapter 1. Introduction
We are living in an urban world. However, most of us do not necessarily live in cities, or at least not in cities as physical entities clearly limited and differentiated from the surrounding countryside, as they existed until the beginning of the twentieth century. We often live in urban agglomerations or urban regions, occupations scattered and dispersed along great extensions of the territory, forming a continuous urban landscape. While some might think of this continuous urban landscape as amorphous because of its boundless character, this research is concerned particularly with its form.

The mutation and explosion of the city into a new urban landscape is a reoccurring subject in urban design texts and research produced at the end of the twentieth century and the beginning of this century. Attempts to understand this transformation have come from many different perspectives. During the second half of the twentieth century, architects and urban designers developed a new vocabulary of terms attempting to name and conceptualize what had become of the city. The beginning of this century approaches the same issue using mapping. The use of mapping to understand the contemporary urban landscape relates in part to the information overload which is characteristic of this time. Mapping attempts to grasp and make operational all that information. While we are interested in all the information which we can get about urban areas, we need to decide what to map.

Framed by the approach to understanding the contemporary city through mapping, there is a line of study which is concerned with the form of the territory and the landscape. These studies highlight the possibilities that mapping can offer to uncover the spatial logic of the contemporary urban landscape. Their emphasize the necessity to map and describe the extension and dimension of urbanization today, for example the way even today some un-urbanized areas are influenced by the urban and thus are integral part of it. Many of them study the basic elements of an urban morphological study: parcels, streets, blocks and buildings. However, when they are mapped at the scale of the territory and in areas outside the traditional city, they can contribute to the understanding of the logic of these areas. They also reveal that there are key principles in the transformation of the territory.

Simultaneously, the study of urban form was an important approach to the city during the 1970s and 80s. During these decades, a large amount of analysis of towns and neighbourhoods were produced in many contexts, among these the Italian, French and British studies had the most consolidated approach. This tradition is still very active studying the morphology of varied sites while attempting, with the creation of the International Seminar of Urban Form (ISUF)\(^1\), to produce a general knowledge and common understanding about the urban morphological approach. However, it has been argued that this tradition concentrated mainly on the study of the traditional city and that it is necessary to study more recent developments and areas in other than European contexts. Even if this situation has somewhat changed, the scale of material is short in comparison to the studies which were conducted in the traditional city.

In this frame, the aim of this research is to generate some understanding and insight about the form of the continuous urban landscape where we all live today. This means a generalized knowledge that can be used as tool to study urban form in different contexts. In order to do this, this research investigates the recent studies about the form of the territory and the landscape which use mapping as tool along with the traditional urban morphology studies. The traditional approaches need to be placed next to those recent attempts to map the spatiality of the contemporary urban landscape. Within that frame, the overall objective is to recuperate the observation of the urban form as a valid approach to the city, without ignoring other complementary approaches.

1. 1. Research questions

This research investigates the possibilities of mapping to clarify the logic behind the spatial and formal dimension (morphology) of the contemporary urban landscape. Moreover, it investigates in spatial terms the transformation from city into an urban landscape; with the aim of discerning the essential elements and processes of that transformation.

As it will be explained in the next chapter, the spatial dimension of the city is still a key issue in understand the contemporary city. Even in times of globalization and invisible networks where one might think of the diminishing relevance of the thinking about the form of the city, this issue acquires a new renewed importance. It is then necessary to understand the logic of how it is transformed. It becomes important to understand that the contemporary city has a different logic than the traditional one. A misunderstanding of the form of the contemporary city has lead to nostalgic approaches that aim to emulate traditional forms. As shown by many recent studies in specific landscapes and territories, mapping becomes a tool to reveal that specific logic.

In this frame, the main research questions are:

- How to generate a common and generalized knowledge about the formal logic of the contemporary urban landscape?
- Which common or repetitive spatial features and principles of formation can be identified in the contemporary urban landscape?

\(^1\) ISUF “is the international organization of urban form researchers and practitioners. It was inaugurated in 1994, bringing together urban morphologists worldwide. It seeks to advance research and practice in fields concerned with the built environment”. www.urbanform.org, consulted 25-09-2009.
- Which elements, scales and abstractions are relevant when mapping the morphology of the contemporary urban landscape? Are they similar or different from those developed by morphological studies of more traditional urban areas?

In order to answer the main research questions, three sets of sub questions need to be investigated first:

A. In general, the specific understanding of urban morphology which is central to the research needs to be clarified by answering the questions:
   - How is urban morphology understood?
   - What is the background of the study of urban morphology?
   - What are the essential elements and techniques in the traditional morphological approaches?

B. In relation to the recent attempts to map urban form in territories and urban regions, it is necessary to introduce those studies and to ask whether common elements, scales and techniques can be identified:
   - How is mapping conceptualized?
   - How is the morphology of the contemporary city approached?
   - What are the essential elements and techniques in those approaches?

C. The aim of finding generalized knowledge about the form of the contemporary city does not imply that all contexts present similar formal configuration. Urban form is also product of its specific context. Questions about general and specific characteristics of the form in relation to the studied context should also be contemplated.
   - Which repetitions in the formal logic of the contemporary city can be identified between different contexts?
   - Which aspects cannot be generalized or are specific responses in the urban form to a specific context and how can a general approach to study of urban morphology reveal singularities of each studied context?

Figure 1. The main components of the research
1.2. Methodology

The methodology of this research is twofold. It is composed of an extensive review of existing relevant literature and an application of mapping to two case studies. Notably the review of existing studies gives answer to the sub questions A and B which were formulated in the previous pages. However, this review alone is not enough to accomplish the aim of this research. In order to develop a generalized knowledge about the morphology of the contemporary urban landscape, the conclusions extracted from mappings of various areas with various objectives and techniques need to be applied to case studies. The several of the mappings which have been studied are of such a variety that the general observations extracted from reviewing them need to be tested. For that reason, the approach through case studies complements the review of existent studies and it concerns with the sub question C. It is in the case studies where the two lines from the traditional morphological approach and the mapping of the landscape and the territory come together. The comparison between the conclusions from the literature review and the case studies produces general observations about the form of the contemporary city, which is the aim of this research. In the following subsections the methodology for the two main parts of body of the research, part 2 as the review of existing studies and part 3 as the case studies, will be stated in more detail.

1.2.1 Methodology for the review of current studies

The main question asked when reviewing the different approaches was about the general elements that could be extracted in order to map the form of the contemporary city. Due to the emphasis given by the recent studies of the form of the landscape and the territory to mapping and cartography (Meulder and Dehaene 2002; Ascher, Font et al. 2004; Mangin 2004; Berger 2006), the approach to review of those studies, as well as the traditional morphological approaches, was extracted from theories of map making and map history. According to this approach, the study of maps can recreate the context in which the maps were elaborated and shed light on their goals and constrains. Theories regarding the inherent properties of mapping as process and text rather than as product were considered (Hall 1992; Harley and Laxton 2001; Pickles 2004). In this sense, the study of the context of the maps and mapmakers becomes as relevant as that of the maps themselves as objects with consigned information. These studies look at what maps can communicate about contexts and as documents with a narrative rather than as unitary objects.

In ‘Mapping time and space’, Edson (1997) investigates how medieval mapmakers viewed the World through a study of their maps. In order to access the ideas in the mind of the mapmakers, the author studies not only the maps themselves in their content and structure, but also the context in which the maps appeared. Similarly, in ‘The new nature of maps’ (Harley and Laxton 2001), the authors suggest that we ought to look at maps as texts. They argue that historical maps can only be interpreted in the context in which they were developed. Context should be understood as “a complex set of interactive forces” (Harley and Laxton 2001) which means that the context influences the map and vice versa. Instead of being a neutral background, the context can explain the map, while a map can explain a specific context. In order to do this, they studying maps and their context in ‘an undivided terrain’, observing three aspects of that context:

- The context of the cartographer: Here the authors coincide with Edson’s observations when she studies the context of medieval mapmakers to extract their worldview. The context of the cartographer also includes the techniques available at the time (as they are looking at the history of maps), thus the techniques applied to produce a specific map. It also includes the cartographer’s intention, interpreted in this research as the public target and goal of the map.
- The context of other maps, this refers to comparisons of maps by the same authors, and examining maps produced at the same time, maps with similar techniques, similar objectives, etc.
- Finally, they talk about the necessity to study the context of the society in which the maps were made as the broader structure. It is the dialogue between the context of a time and the society where the map was made which, in their opinion, needs to be uncovered.

Based on the approach by Haley and Laxton to study of maps as texts and their descriptions, we define three main aspects for the review of existent studies:

1. The context in which the mapmaker produced the map. The context in which the maps are produced explains the selection of specific themes. This context also refers to the public to which the map is directed, and specifically for this research, it also refers to the goals of mapping, or specific objectives the mapmakers had when developing the map and whether this involves a design intention.
2. The context of the map through the study of other maps. In this part, a considerable number of maps belonging to studies con-current with the ones reviewed was compiled. The selection was limited to maps produced within urban design in specific studies, analyses, or designs. This study shows the position of urban morphology in relation to the contemporary city and to the current themes.

From the study of the maps within these two types of contexts, conclusions are derived about the possible
applications for studying the form of the contemporary urban landscape. These conclusions refer to techniques, scales, themes or concepts. They become the foundations to develop the methodology to map the case studies.

1.2.2 Methodology of the case studies

Two main arguments support the necessity of case studies in this research. These refer to the main characteristics of the urban form studies and to the aim of the research:

First, the aim of developing a generalized knowledge of the characteristics of the morphology of the contemporary urban landscape suggests the necessity of engaging in mapping of urban form through comparative case studies where the findings from reviewing existing studies can be tested in existent regions. Because maps from the reviewed studies are context and goal bounded, case studies are needed to apply similar techniques to map existent urban areas to identify repetitive patterns within two different regional spatial configurations. Therefore, the case studies are comparative in order to extract conclusions at a more general level than the specific mapped contexts both of the literature reviewed and of the case studies themselves.

Second, it is important for the study of different contexts to show the relation between urban form and its context. This is an essential element to be investigated if the aim is to look for generalizations. This relation can be explored by mapping and comparing areas in very different contexts. How does a specific context produce specific spatial configurations? How does urban form respond to that context and how does it transform in relation to it? Answering and elaborating on these questions could give hints about the relation between urban form, urban models behind its production, a specific context and the processes influencing urban form. It could also show how that relation occurs.

At the end, the outcome of these two types of observation are conclusions about process of formation that repeat in different contexts while other processes are inherent to specific characteristics of each context; or how similar processes adapt to the contexts. These repetitions should also be studied in relation to the scale of observation in order to understand at which level of resolution it is possible to identify repetitions.

Selection of cases

Because the aim of this thesis is to produce general knowledge, it has been argued that the generalizability of qualitative research increases with heterogeneous case studies (Schofield 2000). With this in mind, the two urban regions selected as case studies are the Randstad in the Netherlands and the Bogotá-Sabana region in Colombia.

The Randstad is the largest urban agglomeration in the west of the Netherlands, and the Bogotá-Sabana is the region formed by the city of Bogotá and its geographical region, namely, the plateau called ‘Sabana’ where 19 other small municipalities are located. Chapter 7 will introduce the different contexts in dept.

Besides the large difference in the contexts of the country, continent and culture, there are also large differences in the regional form. At the regional scale these regions can be described as mononuclear (Bogotá as main centre of the region) and the Randstad as a model of a polynuclear urban region. Within these different regional configurations it is possible to observe two aspects. These are the relationship between different scales and the relationship between principles that allow generalization between the two contexts and those that not.

Within the essential elements that are observed in order to generalize ideas about the form of the contemporary urban landscape, it is important to consider the issue of scale. When we compare two different regional configurations, we can study the relationship between the regional and the more detailed scales. Furthermore, we can observe whether we can find repetitions, at more detailed scales, between the two opposite overall regional configurations.

The selection of these two different regions allows us to explore the question of whether within two different regional configurations, it is possible to encounter repetitions, sometimes simultaneously, or sometimes within a time span, in forms of occupation and in the way urban developments are located and related to the road network. The observations made in regards to these two different contexts allow us to study whether or not similar forms and spatial configurations repeat within very different contexts.

Finally, there is a practical reason for the comparison. This relates to the fact that the author has previous research experience in both contexts. This fact facilitates the process of collection of information.

1.2.3 Cross-comparison: mapping review versus mapping cases

Due to the two-folded character of the methodology of this research, a post-evaluation is needed. This post-evaluation is developed in Part 4, in chapter 9 and it consists of two main parts:

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2 There is a controversy about whether the Randstad exists or not, and in this regard other concepts like the Delta Metropolis have been developed. It is not the aim of this research to discuss cover those issues but to study the main urban agglomeration of the Netherlands independent of what the appropriate name or concept for it would be, or what its limits are. In this case, those issues are only observed from the point of view of the physical and spatial characteristics.
First, the mapping of the cases which have been studied is evaluated with the same criteria used to review the existing studies. This post-evaluation of the cases makes clear the context of the mapmaker (the author) and the techniques used. This facilitates drawing the conclusions about the repetitive and specific process identified through the comparison, as well as the techniques for this identification.

Second, the relation between the conclusions of the review of current literature and the mapping of case studies is considered. The conclusions that each of these two parts separately generated about spatial and formal characteristics of the contemporary urban landscape, are correlated in order to work towards the general conclusions of the research.

1.3. Thesis outline

This thesis is organized in four main parts:

The first part is introductory. After this introduction, the second chapter builds up the theoretical framework for the main elements of the research, namely, urban morphology, mapping the territory and the landscape and the contemporary urban landscape. The assumptions and the positions which this research adopts in relation to the theory around these three subjects are developed in that chapter.

The second part deals with the current studies about urban form, both in the traditional city as well as in recent developments. As explained in the methodology, mapping is the tool for approaching both types of studies. For that reason, this part is called meta-mapping. Chapter 3 deals with the studies of the traditional urban morphology, while Chapter 4 deals with the recent mappings of the territory and the landscape. Chapter five deals with the contexts of the reviewed maps of urban form by reviewing maps produced at the same time as the reviewed ones but in other subjects and contexts. A large collection of recent production of atlases and mapping documents in urban design is included in this chapter and their by looking at common themes and techniques. Finally, chapter 6 elaborates on the conclusions from the literature review of chapter 3, 4 and 5, showing the way these conclusions can be used in the case studies.

The third part contains the case studies. It is divided into two main chapters. Chapter seven introduces the scene for the case studies, explaining the specific methodology for the mapping process. This part also introduces the two contexts: the Randstad and the Bogotá-Sabana regions, reviewing the current studies in urban form for both regions. Chapter eight contains the atlas of the cases; it describes and illustrates the mapping of cross-sections in both contexts and of the two regions. This part concludes with comparative observations between the two.

Finally, the last part correlates the conclusions of the meta-mapping (part 2) and the case studies (part 3). Chapter 9 answers the sub questions of the research and it evaluates the case studies. Chapter 10 answers the main research questions and presents recommendations for future research, suggesting new design tasks.
Figure 2. Organization of parts and chapters of the thesis and their interrelation
Chapter 2.

A closer look at the three main components

Within the different approaches to the complexity of the contemporary city which can be found in the literature, this research focuses on the studies about its form. This chapter introduces the urban morphological approach and its main components. Furthermore, it evaluates the current state of this approach and looks at a line of studies that look at the form of the landscape and the territory as a way to study the form of the contemporary city. Within these studies, mapping emerges as a powerful tool of description and investigation. For that reason, mapping is further developed in the chapter in order to explain how it is used and works in the research. Finally, the idea of the contemporary urban landscape and its differences with the traditional city is explained. This is done through a review of the different terms and conceptualizations that have been developed specially since the second half of the twentieth century. Through this examination we identify authors who argue that the main transformations of the city are not material, and those who argue that within the changes that are at many different levels, space still posses an important role that should be investigated. Finally, these studies generate a list of themes that show what directions ought to be followed in the mapping of characteristic spaces of the contemporary city.
2.1. Urban morphology

First, urban morphology deals with the knowledge of the logic of the form, in this case, urban form. It is studied in several disciplines and it involves looking at physical characteristics, structure, relations and transformations of things and their constituent elements. In this way, morphology is "a branch of biology that deals with the form and structure of animals and plants; a study of the forms, relations, metamorphoses, and phylogenetic developments of forms apart from their functions". In relation to language, it looks at the system of word formation, at the structure and logic of how words are formed. The reason why all these disciplines study the logic of the form lies in the understanding of the morphological dimension as essential part of the explanation of how things are and how they transform, like in the study of growth in organisms (Thompson and Bonner 1969 (1917)). The form is understood as having a sense to be, it is not arbitrary or irrelevant, but belongs to the essence of things and organisms.

In this general introduction to urban morphology it seems essential to start by clarifying what is meant by form. Secchi (2003) has dealt with the problem that different meanings of form generated in the approaches to the form of the city. As he points out, in the context of the simple dictionary definition as the edge or profile of an object that allows us to distinguish it from the background, the contemporary city is form-less since one of its main characteristics is the impossibility to define a contour, a clear line that divides the city from the countryside. In order to define form for this research we can search in the texts of Tatarkiewicz to which Secchi refers us. The form which this research is concerned with is the one defined by Tatarkiewicz as "form in the sense of an arrangement of parts", the form which the Greeks "considered the essence of beauty" (Tatarkiewicz and Harrell 1970). However, it is not the aim of this essay to make esthetical judgments about the studied forms but to identify those different types of arrangements of parts; moreover, to identify the process of organization of these parts and their transformation.

Urban morphology tradition

The study of urban morphology is already a well-known and consolidated approach which has been applied to the urban environment. Within architecture and urban design, the urban morphological approach was in apogee during the 1970s and 80s and it dates to the 60s with seminal works like those by Muratori in Venice and Rome. Within geography, the approach dates also to the 60s with the nominal work of Conzen for the town of Alnwick. Studies in urban form search for explanations of the physical formation of urban areas, based on the idea that urban form can have a relative autonomy from other aspects and therefore its study can generate a specific knowledge about urban areas, inherent to their physicality and spatiality. The emphasis is then on studying urban areas in their physical dimension, buildings, open spaces and their logic of formation and transformation.

Moudon (1994; 1997), has characterized in her texts the three main schools of typo-morphological studies in the European context. These three schools, Italian, French and British, are grouped nowadays under the ISUF aiming to put together scholars dealing with urban morphology around the world and share knowledge about urban morphology. The three schools as well as other studies which are considered important within the aim of this research will be reviewed in the next chapter. This section concentrates on providing a justification of the morphological studies today, at a general level.

Critique to urban morphology

Today, the study of urban morphology seems to have lost importance within the mainstream of approaches to urban design. This study remains mainly in the niche of specific groups like the ISUF or is referred to only within approaches like "The New Urbanism".

Three reasons can explain the diminishing popularity of this approach. In a general frame, as Arida (2003) argues, the current paradigm is no longer formal but relational; the new paradigm of complexity, emergence and non linearity. The reply from Arida to Jencks in the Architecture Review is a simple illustration of this paradigm shift and its influence on the spatial practices. Arida argues against the article about “a new paradigm in architecture” by Jencks and claims that “the new paradigm is not formal, it is purely relational” (Arida). However, it is precisely in this new paradigm that ‘space’ emerges as relevant in many disciplines as many authors have noted (Lefebvre 1970; Sassen 1991; Soja 2000; Harvey 2006).

For example, Sassen (1991; 2001) explains how when thinking about the influence of telecommunications and globalization in the city, has remained only on the side of

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3 Webster's seventh new collegiate dictionary; based on Webster's third new international dictionary Springfield : Merriam, 1976
the "neutralization of geography and place made possible by the new technologies" while the other side has been ignored, where infrastructure, place, and non-expert jobs are required. It is this other side, the one embedded in the city and in its urban space, that has specific location and dimension and unfolds in the space of the city which reconfigures it in some cases.

Secondly, at a more concrete level, the decreasing popularity of the morphological approach since the 1970s and 80s is due to the fact that most of the studies concentrated on the study of areas of historical centres which now constitute only a minority of the variety of forms occupying the contemporary urban landscape. In the case of Great Britain, for example, medieval towns were studied deeply and broadly. In this respect, Moudon (1997) claims that "most urban morphological research has focused on historic European cities, a double limitation which may hinder practical applications in today’s world." Similarly, Hays argues in relation to the Italian Tendenza: “while Tendenza’s model of autonomy seems powerful and, in its basic contours, still correct, what was missed by its arguments is that the very conditions of which its ‘ontology’ depends – namely the traditional European city – had, by the time of its theorization, already disappeared as a contemporaneous object of experience” (Hays 2001).

The preference for a specific type of city, the city until the nineteenth century, is related to what gave these types of studies great importance during their apogee: a reaction to the modern movement’s position against the historical city and its tabula rasa interventions. They advocated studying, documenting, and generating intervention guidelines on areas in the historical centres that were being disregarded and even considered for demolition by modernist approaches. In its beginning, this was mainly a European approach, later reaching other contexts. In relation to this original approach, another criticism deals with the way the study of urban form in the traditional city justifies particular interventions using a repertoire of urban forms belonging to traditional configurations. This is for example the critique addressed to groups like the ‘New Urbanism’ or to contextualists like the Krier’s brothers in the sense that they consider ‘some forms’ valid while others do not. This line of thinking is criticised by Secchi (1993) as a recent negative use of description that justifies mimesis within spatial disciplines: “a mimicry of settlement principles, of rules, of typological variations, of languages”. This use of description “appears to be dictated by nostalgia which overlooks or pushes aside the most difficult problems”.

Finally, some argue that positioning these types of studies within the scientific field remains difficult due to the character of morphological studies that sometimes does not enter the accepted categories. As described by Panerai and Castex in their introduction to ‘Formes Urbaines de l’ilot a la barre’ (1977): “too historic for the theoretician, not enough mathematical to the eyes of the methodological, too empirical for the taste of the historian”. However, Panerai himself points out together with Lange in the introduction to their “Essai de bibliographie raisonnée 1940-2000” (2001) that because of the time and amount of studies on urban form, it is possible to talk about a consolidated approach of urban morphology.

The need to study the form of the contemporary city

As it has been shown, many authors argue that today studying of the space of the city has again acquired relevance. It appears then necessary to identify the specific logic in which that space is organized and transforming. It is necessary to look at the extension that has been qualified as ‘formless’. In relation to the specific study of the form, which is what concerns this research, the absence in the specific understanding of the formation logic of the contemporary city, which Margin (2004) has called “une curieuse absence,” has been highlighted.

For example, the theme of the International Seminar on Urban Form (ISUF) conference in 2007 was ‘urban morphology in a global era’ and called for proposals and studies in other contexts than European ones as well as in recent urban developments. Similarly, Moudon had pleaded earlier for the necessity of pursuing more morphological studies of recent urban developments and in contexts outside Europe. She affirmed that “there is a need for a research to address the unprecedented expansion of cities over the course of this century and a need to direct this research at cities that have grown in non-European cultures” (Moudon 1997).

The argument in favour of the study of urban form today, can be summarized in two points. In the first place, there is the idea of the ‘longue durée’ that discusses the way in which the physical dimension of the city changes at a slower pace than other dimensions like functions, uses of spaces or individual buildings, and therefore it remains along transformations at other levels. Within this frame, it is then necessary to give attention to the elements of ‘longue durée’ because their logic of organization might remain longer than other aspects and thus any intervention should be preceded by an investigation of the existent situation.

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5 ‘trop historique pour le théoricien, pas assez mathémati-que aux yeux du méthodologue, trop empirique au goût de l’historien’ (author’s translation)

The second idea concerns a dialectical relationship between space and social, economical, and political processes. The physical dimension reflects all type of processes that influence this form. However, the physical dimension is not neutral with regards to these processes; it might contribute by reproducing them or making them endure. Moreover, it affects the society that experiences that urban space. What is more important, relative to morphological studies, is that the direction of approach is contrary to what would be normally expected, in the sense that urban form can be contemplated as a valid direction from which to approach the society that lives that space and the ideas of the planners of that reality. Finally, when studying urban form it is possible to read elements that belong essentially to the physical and spatial dimension and which relate directly to the ideologies behind its planning and design. Looking at the urban form from this point of view allow us to investigate the relation between what the disciplines of urbanism and architecture have planned or thought and what the city has become in reality. Understanding the logic of formation of those elements can be useful for designing future interventions and for the evaluation of the current state and re-development and transformation.

2.2. The form of the landscape and the territory

The aim of studying the form of the contemporary city in all its extension and apparent form-less character is not new or unique. Starting from the 1980s, several studies have been developed up until today about the form of the landscape and the territory. These studies, though at the beginning they were mainly specific studies of a case, have grown to produce comparative studies, especially between European cases. In Europe, with the support of texts discussing dispersed urbanization like ‘La Città Diffusa’ (Indovina 1990; 1998), studies conducted in territories of the Veneto, the Milan, Flanders regions, and Cataluña among others, showed to what extent Europe was urbanized and that it had a density not observed before. In the Dutch context, the construction and transformation of the landscape was documented, showing the landscape as a layer lying under existential urban areas which can explain their formal configuration. Finally, in the North American case, a group of scholars studied the morphology of suburban areas, trying to link data like land prices, taxes, uses of public space to that specific suburban form (Southworth and Owens 1993; Moudon 1998).

This group of studies shows a new type of city spreading across the landscape which follows a specific logic, very much influenced by the road network that covers the territory, and that directs new developments distant form existent ones. Moreover, they show how important it is to document, with the aid of cartography, this reality in order to generate tools to intervene in it, derived from the deep knowledge of its particular logic. They reveal that there are also principles in the occupation of the territory.

These studies recognize in cartography and mapping the tool with which they can describe the transformations which occurred in the territory. Already in 1979 Sola Morales argued for the necessity of description and saw the potential of mapping to engage the form of the territory in regards to the development of the Cataluña Atlas (1979; Sola-Morales 1989). However, it is description that “reveals something new” as Secchi (1993) argues, or a mapping that is already a “project in the making” (Corner 1999). As Berger points out, “it is the agency of representation that allows one to find hidden relationships and processes rather than simply “image” them”. (Berger, 2002). De Meulder and Dehaine (2002) also refer to the idea of description but they make clear, using historical references in urban planning, that description is not aimed at fundament conservation or romanticizing of the past but as “a diagnostic moment that recognizes the existent while simultaneously aims at renewing methods”.

Similarly, Font introducing the study “The explosion of the city” (Ascher, Font et al. 2004), a comparative study between thirteen urban regions in south Europe notes: “our starting point is the conviction that there is now a need for a through re-examination of the territory; recognising that its description interpretation and diagnosis are the indispensable elements of applied research. For this reason we have developed a collection of mapping, interpreting and evaluating operations that give us the opportunity to put forward general hypotheses and to construct useful platforms for discussing the possible future of the contemporary territory. Cartography committed to registering and interpreting the changes that have occurred in each of the urban regions under consideration.” These extracts clearly emphasize not only the use of mapping as visualization of the dimension of urbanization and transformation of the territory but also its possibilities to help us to think about future scenarios.

Corboz also discusses the relation of the landscape to the map. He describes how the map is an abstraction which reduces what the landscape is, becoming as a consequence a filter. It is a construction, limited in information and easier to manipulate than the landscape itself, since it follows the wishes of its maker (Corboz 1997 (1983)). Finally, Mangin (Mangin 2004) defends the research through cartography in order to understand the territorial dynamics over other types of representation that attempt to cope with the complexity of the city by using collage, video or statistical analysis.

This research locates along this line and in the recognition of the potentials of mapping from this group of studies. It envisions a possibility of understanding the contemporary city while simultaneously it encounters a methodological tool to review the state of the art of studies in order to continue to map case studies. The studies mentioned
in this section will be reviewed in detail in the second part of the thesis. They are referred to here in order to illustrate the close connection between this approach and mapping. The following section will deal with mapping in more detail.

2.3. Mapping

The reference to mapping and cartography by the studies of the form of the territory and the landscape referred to in the previous section can be understood within a recent mapping revival which has taken place not only in the spatial disciplines but in general. According to Pickles (2004) mapping is currently flourishing, even more in disciplines outside geography and cartography. Hall (1992), for example, in ‘Mapping the Next Millennium’, explores mapping techniques in several disciplines from astronomy to biology, using the new representation and processing techniques developed in the past century. Michel Serres writes an ‘Atlas’ (1995) because the world configured by invisible networks and new relations, ‘even the same space changes and it asks for new world maps’. The issue ‘Archis is atlas’ (2004) deals with the protagonist role which cartography has recently acquired in investigations of architecture and urban design. Finally, ‘Elsewhere mapping’ (2006) starts by acknowledging the recent apogee of mapping and the way this medium has become a useful instrument to combine information and visualize it for purposes of understating complex situations and revealing new relations. It recognizes the potential of mapping as a way “to make the complex accessible, the hidden visible, the unmapable mapable.” (Abrams and Hall 2006)

However, this cartographic enthusiasm also generates doubts. Already, much has been written about the dangers of mapping and the lies of maps (Monmonier 1996; Pickles 2004). Information provided by all these maps is generally not questioned and accepted as true. Maps are provided by internet portals, atlases, information booklets, reports, etc, but nobody asks about the validity or partiality of them. This seems very dangerous since, as many geographers have pointed out (Wood and Fels 1992; Monmonier 1996; Harley and Laxton 2001), maps are images of power, they are manipulated and become very partial truths, culturally and socially bounded. The facts that maps are constructions with specific backgrounds and intentions and that information is placed on or omitted from a map intentionally, is often not acknowledged in this daily use of maps.

Without ignoring the dangers associated with the map and the fact that mapping has never been an innocent activity, this research explores and endorses the possibilities which mapping offers in order to unveil the main spatial characteristics of the contemporary city. This idea elaborates on what in the previous section the studies of the territory and the landscape already suggested. Furthermore, mapping also becomes essential part of the design activity offering opportunities to approach the contemporary city operatively.

Mapping and map

In the project “The history of cartography” (Harley and Woodward 1987) maps are defined as “graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes or events in the human world”. Without elaborating deeper on this idea, it is possible to relate the recent flourishing of mapping, due to the “spatial understanding” that it allows and to the return to the reign of space highlighted by various authors even within disciplines that traditionally did not deal with it. For example, Hall (1992) argues that questions of science like: ‘Where do genes go on the chromosome? or how big is the ozone whole?’ are all geographical and consequently they all require maps in order to be answered. As Harvey (2001) quoted by Pickles (2004) clearly states, “…mapping space” is ‘a fundamental prerequisite to the structuring of any kind of knowledge. All talk about ‘situatedness’, ‘location’ and ‘positionality’ is meaningless without a mapping of the space in which those situations, locations, and positions occur’.

Using the term mapping differs from asking about maps. As Cosgrove (1999) clearly indicates that mapping is about the “acts of visualizing, conceptualizing, recording, representing and creating spaces graphically”. Pickles (2004) argues that “mapping is about the transfer of information from one form of presentation into a representation of that information”. According to the editors of ‘Else/place Mapping’ (Abrams and Hall 2006), mapping “refers to a process” not to a “completed document”. While maps give us a spatial understanding, mapping is the process of doing it, and it is important for this research because it constitutes the process of revealing and decantation through the mapping process, general processes and elements and organization of those elements.

Mapping as design

While describing the main characteristics of mapping, Corner argues that ‘mapping’ is “the most formative and creative act of any design process” and that “the various cartographic procedures of selection, schematization and synthesis make the map already a project in the making” (Corner 1999). He talks about two essential characteristics of mapping: first, there is always an analogy to reality. This is what Pickles calls lines of equivalence between the map and reality. Second, mapping is by definition abstract; it is abstract by being indexical because the information included in a map has been selected and isolated. In this regard, Pickles recalls the idea of the ‘finger’ in the theory of the Swedish geographer Olsson. The finger is indexical because it points to something to draw attention to it. “It delimits from a field a point, a place, an object for our attention. It stabilizes a particular meaning within a world
of possible meanings” (Pickles, 2004). This abstract essence is what makes a map useful. A map attempting to put together too much information loses readability. The multiplicity in the map is not given by the number of variables mapped, but by the relations and links that it uncovers.

The distance between the map and the reality to which it is analogous allows finding relations that become visible only through that process. The process of reduction is also a process of making evident aspects or relations that were not spatially observed before. Instead of considering the main characteristics of mapping, its being partial, subjective and incomplete, as negative, they should be considered essential in the process of exploring design possibilities for a specific area. Mapping can be a generator of ideas to act in a specific place, by showing what is important for the mapmaker at a specific moment. Finally, the transfer of information during mapping involves the agent that does the mapping and its specific context. Maps are only ‘one’ version of that reality, a product of someone’s specific selection. As explained by Hall, when two maps of the same territory interpret it in a totally different way, that will tell us something about a clash of the cultures that produced them (Hall 1992).

The projective character of mapping can also explain its recent popularity within the idea of projective practices7. Projective practice emerges nowadays as a call for action and proposals towards the contemporary urban landscape. It calls for the understanding of what has become of the built landscape and approaching that reality (not an idealized version of it) with a projective eye. Terms like “projective practice” refer to the need to engage the contemporary urban reality through action rather than only through criticism. If mapping is then assumed in all its projective possibilities, it can help in developing the necessary knowledge of the current condition, while at the same time revealing new possibilities. It can become project, design and future possibilities simultaneously. More specifically for the purpose of this research, the observation of mapping as a way to engage a study of the contemporary built environment actively, offers immense possibilities. The intention is to use these possibilities in order to generate tools to investigate, with projective eyes, the form of the contemporary city.

Finally, the conception of these theories of mapping as projective becomes very relevant in relation to one of the motivations of this research, the miss-interpretation of urban morphological studies to reproduce traditional forms. If we understand the formal logic of the contemporary city through mapping, that mapping becomes simultaneously a design intention that emerges from a specific logic and this is different in most cases from that of the traditional city.

### 2.4. From city to urban landscape: A new vocabulary of terms and metaphors

The need to conceptualize the changes which the city experienced along the twentieth century generated a whole vocabulary of new terms to refer to that transformation and the new entity that emerged from it. Within this vocabulary, we find new words, existent worlds redefined by combining pre-fixes or metaphors using terms from biology or mathematics. Each term has a specific connotation or a specific definition depending on the context in which it is placed. Within the frame of this research, it becomes in some cases difficult to find the correct term to name this new urban entity. The built environment, the urban landscape, the territory, the urban field, all these names could be talking about the same or about totally different entities or viewpoints. For this reason, it seems necessary to dig inside the elements of this new vocabulary, to understand their different connotations and specific contexts in order to understand how the expansion of the city has been conceptualized and by means of this knowledge, to apprehend some of the transformation of the city through the attempts to conceptualize it.

This subchapter deals with the vocabulary developed to document and conceptualize that transformation, namely, the attempts to name the urban structure emerging from the trespassing of the physical and mental borders of the traditional city. Each of the terms of this new vocabulary has a specific accent, context and viewpoint. However, they are all somehow involved with the transformation of the city by the introduction of new communication systems, the increasing individualization, the complexity paradigm, by a world becoming entirely urban, where most of the population lives in cities, and by the emergence of a capitalist global economical order, i.e., the global condition at the end of the twentieth century. The element constituting the biggest difference between the metropolis, product of the industrial revolution, and the contemporary urban condition is the character of these technologies that are based on the individual. The technologies that immensely changed the urban condition through the twentieth century have to do with allowing the individual to decide, they are different from the ones that constituted the bases of the great metropolis and concentrated on the opposite, the mass: water, electricity, sewage systems and massive transport.

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Additionally, the different terms of this vocabulary will be examined and discussed in relation to the physical and spatial dimension. How do the different concepts describe or deal with the space of the contemporary city? Finally, as will be observed, the associations between some of the concepts are not strictly chronological, but they illustrate common approaches or shared viewpoints.

2.4.1 The dissolution of the opposition suburbia-centre: suburbia becomes a new type of city

Dissolution of suburbia
As shown by Fishman (1987), suburbia, which is although always thought about in relation to the automobile, did not originate with it. It already originated with the train and tram systems, as we can see in numerous studies from the United Kingdom and the United States. In England, the emergent middle class moved away from the city into single detached houses which were organized around train stations. Similarly, in Belgium the public transport system facilitated a very early dispersion of single houses in the countryside, not necessarily depending on the auto (Smets 1977; Meulder, Schreurs et al. 1999).

As a consequence of the development of the automobile industry and the expansion of highways, especially in North America, suburbia starts to proliferate and to transform. New functions appear alongside transport networks, and suburbia begins to depend on more than one centre. Furthermore, various types of suburban development also emerge in different contexts, outside the United States. In the context of these transformations, which dissolve the opposition between the city as the centre and a dependant residential suburbia, the vocabulary of this review starts developing. This process, clearly described by Fishman (1990) for the context of the United States as ‘the dissolution of suburbia’, can also be observed later in Europe and in the rest of the world.

It does not make sense to talk anymore in terms of two opposites, the city against the countryside (an old opposition), and the city against suburbia (a later opposition). It is no longer the typical north American suburbia, it is the same model that has gone through many varied contexts, and combined with the pre-existent, it created what we experience today as an extended urban field, this stage that has been called both post-suburban or post-urban (GUST, 1999). Terms like citta diffusa (Indovina 1990), dispersed city (Stafford 1962; Burton 1963) or edge city (Garreau 1992) talk about areas outside the traditional city which also acquire the label of ‘city’, but they are of another type. Generally, we could say that many of the terms this section will review refer to this transformation; however, each of them has sprung from a specific approach that we will try to characterize here shortly.

North American case
Garreau writing about the edge city in his 1991 book, refers to the evolution of the exclusively residential suburbia into an autonomous structure no longer dependant on the central city or in opposition to it. It is not anymore exclusively residential and it has become more than only a satellite from the traditional centres. This same transformation is described by Soja in his article: “Sprawl is no longer what it used to be” and it is called exopolis (Soja 1992; 2002).

Between these terms there are common points but there are also differences. Garreau’s very specific definition of ‘edge city’ is mainly justified by using data like the amount of jobs and areas for different functions, while the idea that “it is perceived by its inhabitants as one place” is not developed any further. He also refers to new centres as if he was talking about the traditional centres and as a result he misses the fact that the inhabitant of the edge city is not connected to only one centre, but many; moreover, some centres are central for some people but not for others. Similarly, ‘exopolis’ is defined by Soja (1992) as “the city without”, because of its ambiguity: “city-full non-city-ness… improbable cities where centrality is virtually ubiquitous,” this idea, illustrated by the example of Orange County, shares common points with the ‘edge city’, as Soja self admits: “Some have called these amorphous replacements of suburbia outer cities or edge cities; others dub them technopolies, technoburbs, silicon landscapes, postsuburbia, metroplex. I will name them collectively , exopolis, the city without” (Soja 1992).

Soja relates the transformation of sprawl to the concept of sustainability and the changes that this concept has experienced in what he calls the ‘postmetropolitan era’. By comparing the density of Los Angeles, considered the apotheosis of sprawl, with the 33 largest metropolitan areas in the US, Soja examines why Los Angeles appears as to be the densest, even more dense than New York. The explanation for this in Soja’s term is the “urbanization of suburbia”: “Los Angeles older suburban rings, once the archetype of American suburbia, are now the densest in the country and, as with booming Orange County, deserve to be called cities in themselves.”

What Soja illustrates in the article, by showing the confuse and contrary definitions and evaluations of sprawl and indicators to measure and control it in the United States, is the dissolutions of the existence of two opposites: the geographically differentiated compact city against the dispersed, suburban against urban, the dissolution of an existent conception that added positive value to the compact city and inherent negative implications to sprawl, linked always to mono-functionality, car dependence, extensive consumption of land and pollution. “They suggest that compactness is not automatically a virtue, nor will densification alone resolve problems of poverty and urban decline. Similarly, large scale but low density suburban development in itself may have no discernable
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<td>1992</td>
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<td></td>
<td>100 mile city (Sudjic 1992)</td>
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<tr>
<td>1994</td>
<td>Le règne de l’urbain et la mort de la ville (The reign of the urban and the death of the city) (Choay 1994)</td>
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<td></td>
<td>Generic city (Koolhaas 1995)</td>
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<td>Hyperville (Corboz 1994)</td>
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<td>1995</td>
<td>City of bits (Mitchell 1995)</td>
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<td>Metropolis (Ascher 1995)</td>
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<td>1996</td>
<td>Cybercity (Boyer 1996)</td>
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<td>Ladders (Pope 1996)</td>
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<td>1997</td>
<td>Zwischenstadt, cities without cities</td>
<td>(Sieverts 2003)</td>
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<td>1999</td>
<td>X-urbia, X-Urban city (Gandelsonas 1999)</td>
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<td>2000</td>
<td>After the city (Lerup 2000)</td>
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<td></td>
<td>Postmetropolis (Soja 2000)</td>
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<td>2001</td>
<td>Slash city (Ellin 2001)</td>
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<td></td>
<td>global-city-region (Scott 2001)</td>
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<td>2002</td>
<td>Quantum city (Arida 2002)</td>
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<td>2003</td>
<td>Netztstadt (Oswald, Baccini et al. 2003)</td>
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<td>2004</td>
<td>La Ville Franchisée (Franchised city)</td>
<td>(Mangin 2004)</td>
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<td></td>
<td>Tussenland (Frijters and R.P.B 2004)</td>
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<tr>
<td>2006</td>
<td>Horizontal city (Berger 2006)</td>
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<tr>
<td></td>
<td>Polyopolis, Polycentric Metropolis</td>
<td>(Hall and Pain 2006)</td>
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Table 1. Timeline of a selection of terms of the new vocabulary to name the contemporary city.
effect whatsoever on the conditions of inner cities.”

The same idea, studied in architectural terms, appears in Gandelsonas’ ‘X Urbanism’ (1999): “The changes brought by the X-Urban city define a new urbanity not organized anymore in oppositional terms such as center versus periphery but as a multicenter city, not as a dominant totality versus subordinated parts but as a nonhierarchical fragmented urbanized territory.” To finalize the North American examples, Ladders by Pope (1996) describes through a ‘journey along the evolution of the American city’ ‘the transformation from a centripetal grid, typical of the nineteenth century city, to a centrifugal one in the contemporary city’. The main element of the centrifugal city is the ladder8. “Pope defines ladder as the ‘remainder of a partially eroded grid’ or a closed fragment of urban structure. The ladder is a useful structural notion which describes the disintegration of the contemporary city into an endless system of disconnected enclaves reflected in the organization of much of suburbia” (Livesey 2004). While showing the transformation from an open city to a closed one in the transformation of the grid into the ladder, an exclusive system, Pope also shows how the historical urban core experiences a process of reorganization. “From freeways through parking garages, and into pedestrian bridges and tunnel systems, the city center is systematically restructured by a succession of centripetal overlays” (Pope 1996). Through this process, the core acquires characteristics of the ladders, inundated by space and discontinuity.

This new entity, which all the terms cited above refer to, is also a ‘city’ in the sense that it combines many functions and different centres. But these centres are nothing like the traditional downtowns. There is a new structure for these areas that is provided by the system of infrastructure. For example, in the North American post-urban era the networks of express ways define the structure of metropolitan America (Teaford 1986). At the same time, the fact that these terms refer to a new city that has emerged from the traditional suburbia, does not mean that they do not talk about the traditional centres; these have also gone through transformations due to movement of people and functions, towards the previous peripheries. They have lost population, jobs and commercial functions that moved outside, or they have incorporated characteristics of the edge developments like parking facilities and even shopping malls in order to compete against those new centres.

Dispersion and diffusion

In contrast, the term ‘dispersed city’, the oldest of those mentioned here, refers to: “functionally interdependent cities, located in close proximity, but physically separated by nonurban land” (Burton 1963). In this case, there is no transformation of a mono-functional suburbia towards a new or a different type of centre, but it is towards the functional specialization of small towns, creating a new type of city (dispersed city) by their interaction facilitated by a good automobile connection system. However, it still refers to a type of relation within an existent centre and new developments that occur at a distance and not spatially continuous to that existent centre.

Indovina used the term ‘Città Diffusa’ (Indovina 1990) to describe the urbanized territories of the Veneto. His text became an invaluable and mandatory reference for later studies and it contributed to the study of other European contexts, like the Spanish ‘ciudad dispersa’ (Monclús 1998). It shows how the phenomenon, which was at the beginning exclusively dealt with in the North American context, appears also in many other contexts. In the case of Indovina it is shown in the Italian one, but also as the book edited by Monclús (1998) shows, it is also found in Spanish, Portuguese and Latin-American contexts.

The diffuse city of Indovina does not only describe diffuse expansion of the existent city but it also describes a new ‘organizational structure’ (Indovina 1998) which differs from the rural space urbanized and from the dispersed urbanization. It is a structure that appears similar in spatial terms to the rural occupation but that differs in qualitative terms because it is very well connected with its context and it has urban qualities. It is also for Indovina qualitative in the sense that if we observe only spatial and morphological characteristics of this new type of structure, it would be impossible to name it urban; while if we observe the economic, social and cultural elements, these areas are from an urban type. In the sense that it is dealt with as a new structure, it can be comparable to the terms like exopolis or edge city. Indovina also describes as in the other cases how the citta diffusa is not only formed by one type of residential development (dispersed) but by different types of infrastructure and other functions, services and even public spaces. All these elements are dispersed in the territory and accessible to the automobile as the main structure organizing and localizing principle.

To continue

All the referred terms both for the North American and European context: Edge city, exopolis, X-urban city and Citta Diffusa, deal with a city, but with a different type of city. They refer to decentralization and polycentrism, and to new centres different from the traditional ones. They all coincide in the attractiveness that is attached to this new type of city against the concentrated traditional one, because of the spaciousness permitting location of all type of activities and of single family houses and because of the good accessibility to the automobile that the traditional city does not offer. We distinguish then what Fishman describes in ‘Rise and Fall of Suburbia’ (Fishman 1987) as the triumph of the automobile or the

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8 “For the purpose of this investigation, the centripetal urban grid will be referred to as a grid in the process of turning into something else, an index of the city that is in the process of turning into something else. This other urban form will be referred to as a ladder. As a unique urban structure, the ladder has emerged as the fundamental armature of post-war redevelopment and reconstruction” (Pope 1996).
individual mode of transportation and the organization of it in the territory. As Indovina explains, it is not only the fact that this new type of city is attractive but also that the existent city repels inhabitants because of the limitations that it implies. Finally, it is important to observe that all the various cases do not necessarily suggest the end of the traditional city, but they imply the emergence of a new structure as explained with the example of Ladders by Pope, where the traditional city remains but it experiences many transformations influenced by the new type of city.

These observations show that mapping of the contemporary urban landscape ought to include the study of rural areas and open areas within areas of the traditional cities since they are all part of this new urban structure. Similarly, these areas need to be understood in their relation to the infrastructure which connects them rapidly with different centres.

2.4.2 The middle landscape, in-between city, tussenland

This set of concepts deals with the state of being in-between: between pre-existent notions like city, downtown, suburb and countryside. To start with, the term 'middle landscape' was defined in 1964 by Leo Marx in 'The Machine in the Garden' (Marx 1979). Using the image of the grass cutting machine in the middle of the garden of a typical single family house, Marx describes the intermediate between nature and the machine. In this case, it is an interference of one in the other. It talks about mediation between nature and the city where one (coming from the city) can escape to nature in this middle landscape. As Lerup states, "there is another generic ecology, common in all suburban metropolises, known enigmatically since Leo Marx as the middle landscape." “Located between defined domains (downtown and suburb), the middle landscape is unfinished, incomplete, waiting somewhere between development and squalor. Hard to grasp, hard to write, even in its most rational and technical aspects, this territory is an in-between, neither here nor there." (Lerup 2000)

P. Rowe (1991) uses the term more directly to talk about a middle landscape between city and countryside. This middle landscape is in territorial terms "a sprawling metropolitan cultural and spatial mosaic." It is a kind of suburbia which is no longer exclusively residential or dependant on one centre, neither has it a centre as a contrast. It is a combination of urban, suburban and countryside into a 'metropolitan suburban landscape'. In this sense, the notion of middle landscape by Rowe relates to those in the previous section. As the main artefacts of the middle landscape, Rowe identifies the single-family house and its garden, the retail areas, working areas and the infrastructure that facilitates mobility. He describes then the variation and transformation of these areas to satisfy more users in the metropolitan suburban landscape. Finally, Rowe proposes possible design agendas for the middle landscape. He claims that "the most disconcerting physical characteristics of the middle landscape is the desolate and inhospitable space left between many buildings and building complexes.” Consequently, the design approaches he proposes deal with that condition.

In the Dutch context, the term Tussenland (Frijters, Hamers et al. 2004) uses the same metaphor of being 'in-between'. However in this case, in-between designates a rather different idea than the previous cases of Lerup and Rowe. It is a term used to refer to the heavily networked, polycentric urban area like the Dutch one. Tussenland is between 'stad' (city) and 'land' (countryside). It includes emerging centres, accommodates areas for different types of leisure and it usually includes areas crossed by infrastructure that become a barrier. These areas usually locate between administrative or political borders which decrease their unity. Their character between city and countryside is given by location, structure and type of property. These areas are known by everyone around all cities which are rarely in the maps. One of the concerns of the R.P.B. study is that these areas rarely appear within the planning documents. The conclusions of the study suggest the potential of these areas. They are not just leftover space but areas possessing both rural and urban characteristics, they have developed spontaneously and even informally. Finally, they can be sustainable since they accept change of functions, adapting to new situations.

In the German context, the concept of Zwischenstadt, 'Cities without Cities', is developed. It uses as its main example the Ruhr area but it is describing a phenomenon that can be found today anywhere in the world. “The term Zwischenstadt signifies that today's city is in an 'in-between' state, a state between place and world, space and time, city and country” (Sieverts 2003). Sieverts claims that Zwischenstadt is the term used to refer to the type of urban area belonging to a new form of city after the dissolution of the compact historical city and what he calls the urbanized landscape, between the 'old historical city centres and the open countryside'. However, even though Sieverts emphasizes the idea of in-between, his book uses and develops the idea of a 'new form of city.' In this regard this term and the elaboration by the author would also have relation to those developed in the next section in which we discuss new totalities.

For this research the description Sieverts offers of spatial features of the Zwischenstadt is very important and relevant. According to him the boundaries between city, open space and nature are dissolving; “the gradual disappearance of traditional hierarchical pattern; and the mutual penetration of built forms and landscapes”. It is a special combination of open and built space where

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9 Tussenland, a dutch term developed in the quoted report by the Ruimtelijk Planbureau (Frijters, Hamers et al. 2004). It is translated by the authors in the English summary as ‘land-in-between’.
the open space is the binding element. Instead of the common pattern of built concentrations surrounded by landscape, in the Zwischenstadt most of the times the opposite occurs, namely, build clusters which enclose the landscape.

Sieverts goes further to define the strategic possibilities of intervention which do not have their roots in the idea of what the European city should be as the historical compact city, but which emerge from the specific condition of the Zwischenstadt. “The book deals with the discrepancy between the urban reality and prevailing ideologies of what a European city should be” (Sieverts 2003). He warn us of the dangers of idealizing the European traditional city, but also of a recent trend to approach uncritically and even admire the unorganized character of the Zwischenstadt. Thus while Zwischenstadt has qualities and character of its own that need to be discovered, looking beyond its opposition to the historical city, it also contains many conflicts that need to be addressed.

In summary, the terms reviewed above share ideas that can be help in understanding the spatial and physical characteristics of the contemporary urban landscape and for the mapping of the cases. First, they all coincide in the idea that today built and open areas interact to form a built landscape. Second, within this networked and non hierarchical combination of built and open, it is the open space that becomes the binding element. Similarly, the areas in-between different types of borders become very important. Finally, they highlight the need to develop interventions which are rooted in the specific characteristics of this urban landscape which holds also a potential for new qualities.

2.4.3 New totalities: Mega- Megalo- Meta- Polyo- polis

While suburbia, sprawl or dispersion, describe a new type of city, in this section we look at reflections about new totalities and the accelerated growth of the city into an entity which needs a new name. The concept of city needs a re-definition in its totality, not only as physical entity but in terms of many other indicators like jobs, interchange, communications, production, etc. To start with, we note that this set of terms is dealing with a matter of dimension. The concept of megacity, as the name indicates, refers mainly to size: cities of at least 10 million people. However, it has been argued that for a better understanding of the problematic of megacities, which are increasing in number in the world, the concept needs to be better defined, beyond the issue of size (Fuchs and United Nations University. 1994).

The next concept, Megalopolis, was introduced by Gottmann (1961) for the Urbanized Northeastern Seaboard of the United States. “Megalopolis is a vast area, it encompasses many great cities, and its population is now close to 38 million, which is more the size of a nation than of a metropolis.” The particularity of this area was the enormous concentrations of activities and people, its importance at national and world scale, and its dimension, crossing established administrative and political borders. In such a case, the term metropolitan area was insufficient. “A special name is needed, therefore, to identify this particular geographical area.” Moreover, Gottmann pleads for redefining concepts like those of city and country affirming that “the old distinctions of rural and urban do not apply here any more.” (Gottmann 1961)

Gottmann argued that the particularity and uniqueness of the case he found deserved a closer study because it could offer important lessons not only for that megalopolis but also in general for other areas which may be in the same process of becoming megalopolises. He claimed that he had never seen this type of configuration in such dimension and significance and therefore he thought that its study could act as a laboratory for urban growth. “Indeed, the area may be considered the cradle of a new order in the organization of inhabited space” (Gottmann 1961). At the end of the book, Gottmann concludes that based on his recent visits to other cities in the world, the trends he observed at earlier stages in Megalopolis were already present in many other cities and metropolises around the globe. Comparing the two concepts, megacity and megalopolis, we see how megalopolis comprises the idea of many centres or many urban and suburban areas together forming a continuity while megacity refers mainly to one centre or one main city.

A more recent concept is Metapolis by Asher (1995). Metapolis is formed by “distended, discontinuous, heterogeneous and multi-polar urban territories; there is no longer a clear boundary between the city and the countryside. New kinds of places and centres have appeared in the peripheries: commercial centres, urban research centres, logistic platforms (places where almost all facilities are available); public and private spaces have been reconstituted at all levels, from the inside of the house which opens to the outside world through new communication technologies, to the external spaces which are conspicuous by their exclusive logic” (Asher 2001).

The author shows that what is different in this post-metropolis phase is the discontinuity facilitated by communication and transport networks. The types of relations within them are new. While the form of growth that characterized the two previous modernities is either internal by densification or by extension into peripheries, the form of growth in the metropolis is external in the sense that it means the incorporation into the area of quotidian functioning of a metropolis, villages, urban and open areas further and further away (Asher 1995).

Like Gottman’s discussion of Megalopolis, Asher discusses new modes of life, activities and land uses that
the Metapolis phase generates. But unlike the megalopolis and the Polypolis (described in next paragraph), the metapolis can be poly- or mono-centric; it can follow different types of growth; it can have different types of densities or types of occupation of the territory. The concept of Metapolis covers all these possibilities since it is composed by “all the ensemble of spaces where all or part of its inhabitants, economical activities or territories are integrated in the quotidian functioning of a metropolis” (Asher 2001). We see in this definition the broadness of the concept, covering spatial and territorial aspects at the same time with functional and economical ones. As Asher mentions in his introduction, “metapolis seems to cover and go beyond, from diverse viewpoints, the politropolises that we know at present.”

Finally, the concept of the Polypolis or the polycentric megacity region (MCR) was introduced by P. Hall and K. Pain in their Polymet studio (Hall and Pain 2006). The concept emphasises polycentrality which is the outcome of a process of decentralization from the main central city into smaller specialized centres. The authors claim that “this is the emerging urban form of the 21st century.”

The difference with Gottmann’s concept, as stated by the authors, lies in the degree of complexity because of its highly interconnected network “based on Castell’s ‘space of flows’ connecting the individual urban elements”.

In summary, all concepts since the introduction of Megapololis describe a new phase after the metropolis where regions become a “new urban form” (Hall and Pain 2006), (Asher 1995). According to Castells, what makes megacities a new urban form “is this distinctive feature of being globally connected and locally disconnected”. Moreover, while they establish functional linkages with large areas around, the pattern of occupation and land use is very discontinuous (Castells 2000). In this new form, other cities, smaller urban areas, rural and open areas are all affected, becoming part of the functioning area of that metropolis. All concepts agree on the limitations of the central places theory of Christaller (1966) (1933) today because there is no longer an urban entity which has only one main centre like in the metropolis; while centres are still important these are not the only important type structure in the city. Consequently, an attempt to characterize this new urban entity through mapping must involve the idea of new centres and centres of different types. Moreover, it needs to deal with the spatial discontinuity which generates that in-between state referred to in the previous section, seemingly ignored when thinking only in terms of centres.

2.4.4 World city and Global city

The last term in the previous section, “Polycentric Megacity Region (MCR)” (Hall and Pain 2006) helps to introduce the concepts in this section. These focus on the influence of globalization on the city and therefore, the emergence of ‘global cities’ or ‘world cities’. Hall and Pain argue that starting in the 21st century, the emphasis should be on the region and accordingly, we should talk about the ‘global-city-region’ (Scott 2001). “This treats world cities as more than simply centre-cores; they are viewed as more complex urban regions, encompassing several cities, networked in a polycentric structure” (Hall and Pain 2006).

In Cities in evolution written 1915, Geddes already used the term ‘world city’ (Geddes and Johnson-Marshall 1968) to refer to “new and vaster groupings or conurbations”. P Hall in 1966 discussed world cities because they played multiple roles: centres of banks, political centres, trade centres, centres of advanced services, cultural centres, higher education centres, etc, at various scales: national, regional and international. Friedmann’s text of 1986 is an important basis for further research on world cities. He introduced a hierarchy of world cities, identifying 18 core and 12 semi-peripheral world cities of that moment.

Basically, the concepts of world and global city deal with a new scale, the scale of the world, on which cities are performing. This means that these cities transcend national borders and begin functioning at a global scale. The concept refers to a stage in the evolution of cities when they reach this global scale. The group Globalization and World Cities (GaWC), developed a ranking of world city-ness values, and identified by 2004 ten Global cities, called Alpha world cities. After these top ten, they defined different levels of ‘world city’, the last of which is ‘evidence of world city formation’ (Taylor 2004).

Like with other concepts developed about the city, this idea of the world or global city (Sassen 1991) does not imply a total break with the existent city but the emergence of new orders and relations that come to co-exist with the existent ones and which simultaneously transform and are transformed by them. In the case of the global city (Sassen 1991), new technologies and economical globalization create new spatialities and temporalities. These coexist with the existent ones, and more so in global cities. “The global city is a border zone where the old spatialities and temporalities of the national and the new ones of the global digital age engage. Out of their juxtaposition comes the possibility of a whole series of new economic and cultural projects.” (Sassen 1991)

As it was already explained earlier in this chapter, for Sassen, the global city, with its relation to globalized economy and partial de-nationalization does not merely imply hyper-mobility and space-time compression. At the same time that these global, de-nationalized entities develop, they need a specific location and they do generate all sets of relations in the spaces where they are located. This hyper-mobility and space-time compression is produced, managed and serviced in these spaces and needs many material and human resources. “The global city is emblematic here, with its vast concentrations of hyper-mobile dematerialized financial instruments and
the enormous concentrations of material and place-bound resources that it takes to have the former circulating around the globe in a second” (Sassen 1991).

If we are interested in the space and physical structures of the city, then the development of the global city concept is very relevant since, as Sassen argues, the mainstream of discussions over the global city only consider one aspect, the one of de-materialization and of the high streams of actors involved in the global economy, while they overlook the rest. The cleaning workers of Wall Street for example, or the factory workers in an electronics factory are examples of other aspects of globalization sometimes disregarded in relation to the city. These also generate all sort of new relations that are very clearly embedded in place and space and in the physical dimension of this global city. The key issue here is not that the local has disappeared but that it can interact directly with the global, without mediation of the intermediate scales. Global and local are then not just opposites where global implies de-territorialization and local implies spatial proximity. Furthermore, Sassen argues that contrary to the belief that these regions are no longer related to topographic space, many of these networks still use the means of traditional communication like rail and road.

2.4.5 Network city

Parallel and connected to the idea of ‘global city’ we find the idea of ‘network city’. This idea differs from the concepts developed in the previous section because it emphasises the networked character of the contemporary city. It focuses on the changes generated in the city by the network society and new communication technologies. The main references are the texts by Castells, specially “The rise of the network society” (2000) and the “Urbanism of networks” by Dupuy (1991). Castells presents the basic aspects of the network society and its influence on the city, stating the opposition and change ‘from a space of places to a space of flows’. Dupuy develops the possibilities of a network urbanism: “a territorial urban organization in the form of networks”, calling for a new disciplinary approach from urbanism in terms of networks against the zoning that has dominated the urban approaches so far.

“The term network is used to designate a new economic, social and spatial context that has been made possible by the development and application of information and communication technology” (Garritzmann and Nio 2000). The characteristics of a network, non-linear and non-hierarchical, constitute the bases of how society works today. The idea of a network urbanism explores the implications for the urban of the fact that almost any place in the world is connected to various sets of networks of communication and information.

Dupuy (2000) defines three main characteristics for the modern meaning of network. The first is topological, because of the aim for direct relationships and ubiquity of the network. Within the topological we see a shift from topographical and geographical distances to the topological and whether there is a connection to the network. By quoting the Lineal City by Soria y Matta (1886) and the television and telephone networks, and later the internet, Dupuy shows how the topological deals with being connected beyond administrative and political borders, and questions the ideas of centre and periphery in the industrial city. The second is kinetic, because of the movement inherent in the network that aims for instantaneousness and speed in transfers. Finally, the third characteristic of the network is to be adaptive. The kinetic aspect of the network brings space and time in relation to the urban. The network facilities are focused on time defining a new temporality where speed is very important, specially they aim at the possibilities of controlling and accessing that speed without obstacles. Finally, the adaptive dimension of the network lies in its ability to adapt to new needs and requirements and users. It should be able to grow and expand depending of the requirements of the users and of the flow.

One of the main characteristics of the network city is the overlapping of different types of networks allowing different connections, but also at different locations. Changes in the spatial dimension are for example, home based activities, telework, and the possibility to have contact through networks with any place in the world; generating with this simultaneously new specialized centres and decentralization. As Nio points out, “in fact, the network city does not coincide unambiguously with the built environment; it is very largely an invisible city, a spider’s web of invisible functional and social relationships running across and through one another (Nio 2000).

Even if the ‘network city’ does not coincide with the built environment, the overload of flows and virtual communication does not represent the end of the physical dimension of the city, as many scholars have argued. It alters the physical and spatial dimension of the city by creating new centres and decentralization and by connecting distant places. What happens is that the powerful logic of the network alters the meaning and dynamics of places. The tendency is towards a space of flows that imposes its logic on top of fragmented and disconnected places (Castells 2000). In fact, the idea of network city or “networked city” refers to a new way of seeing and understanding the city (the contemporary city as well as its earlier periods) rather than a new type of city or new stage of the city. Furthermore, it pleas for a network approach to the strategies to plan the city rooted in “the recognition of the full plurality of highly unequal voices in contemporary cities” (Graham and Marvin 2002).
2.4.6 The city, telematics and complex systems

This section discusses the terms which deal with the transformations of the city within the logics of virtual communication, computer networks and of the quantum and complexity paradigm. In CyberCities, Boyer (1996) questions the implications of the virtual world and virtual communication in the real one. Similarly, Mitchell’s ‘City of bits’ (1995) discusses the relation between the logic of the city and the new logic of the net. In Quantum city, Arida introduces the quantum paradigm as a new metaphor and language to approach the complexity of the contemporary city. These texts argue that there are essential changes occurring in our relation to the city produced by new technologies and therefore, our approach to design, architecture and urbanism in the city should also be re-defined.

Boyer is concerned with the distance from the material reality generated by the computer and the net, making a concrete action impossible. Our contact with the city is mediated by all those technologies which continuously reproduce images of the city, distancing us from material reality and from concrete solutions or actions. As Boyer argues, referring to Gibson’s Neuromancer, “cyberspace pulls the user into the receding space of the electronic matrix in total withdrawal from the world. Thus our critical engagement with the city is, at best, action at distance.” (Boyer 1996)

She argues that while we spend more time in cyberspace, we will have less to spend in real space. This has implications in the city; “dematerialization of physical space and chronological time”. Moreover, time and place are turned into a matrix of electronic and virtual networks, “linking together distant places around the globe”. “In CyberCity we seem to be continuously in motion –be it driving the freeways, shopping at the mall, or pushing carts through super-market aisles” (Boyer 1996).

Mitchell also discusses the displacement from material to virtual reality. For example, he points out that “storage of bits is displacing storage of physical artefacts”. With examples like the library, theatre, hospital or prison, Mitchell shows that the bits logic is re-defining these spaces where material space is not as necessary as it was before. Physical contact is also not so necessary in most of the cases. What you need is only to be in a point where you can connect to the network and access all the information you need. Virtual interaction replaces in many ways the real interaction. In this context, essential spaces of the city like the meeting place or the street have new definitions in the Internet. New neighbourhoods, communities, and ways to navigate and to find information appear which do not require physical movement or presence. “The very idea of a city is challenged and must eventually be reconceived”. (Mitchell 1995)

Finally, Arida explores how “the world of quantum theory, in all its strangeness and changeability, could in fact provide a metaphorical language applicable to urban design”; “a language that described best the complex artefact that is the city” (Arida 2002). Contrary to Boyer and Mitchell, Arida does not deal with telematics or with the invisible networks and its implications on the city. He looks at the Quantum theory as a possible metaphor that would help us to observe the city today and would show us alternatives for a type of intervention which is less deterministic. “According to quantum theory, the subatomic world is made up of possibilities and tendencies, not of physical certainties. Neither simply particles nor simply waves, the building blocks of our universe can only be described as complementary, hybrid particle–waves... They operate in potentiality fields whose processes are dynamically ruled by the Uncertainty Principle...” (Arida 2003). From this basic principle of the quantum theory he goes further to define a language and a possible strategy for urban design. This strategy is based on the principles of uncertainty and emergence.

2.4.7 The contemporary urban landscape

In an attempt to define the entity that replaces the city, the concept of the landscape is incorporated into the discussion. Terms like ‘urbanized landscape’ appear more frequent in texts about the contemporary city. Similarly, publications like the “Atlas of change” (Baart 2000), argue that the Netherlands is entirely urban. In this case we are looking at two different features: first, the broad influence of the urban even in open areas, in other words, the involvement of these open areas in the urban dynamics. Second, it is the culturization of the natural world, the “fact that the natural world has now been almost completely penetrated by artefacts and the contrast between city and countryside has therefore dissolved” (Sieverts 2003). This framework explains the emergent importance of landscape studies and landscape design in a larger and broader disciplinary frame.

The idea of the open space as being the binding element in the Zwischenstadt which was put forward by Sieverts coincides with the emergence and importance of landscape urbanism and therefore, with the ‘contemporary urban landscape’ which is a more adequate term covering the new urban totality. Lerup makes a similar point: “The trajectory of the old city was toward complete and utter artifice (think of nature in Paris or Rome!); the (suburban) metropolis points in the opposite direction toward nature, or should we say toward preternatural alloy of nature and artifice” (Lerup 2000). If the open space is the binding element then it replaces architecture as the essential constituent element of intervention. As Waldhein notes, “landscape urbanism describes a disciplinary realignment currently underway in which landscape replaces architecture as the basic building block of contemporary urbanism” (Waldheim 2006). The open areas become the main component and equivalent to what the built one
was to the traditional compact city. Steenbergen also highlights this point: “When the city disintegrates into an archipelago of fragments subject to changing economic, historical, political and cultural force fields, a new role is imposed on the landscape as a carrier of topographical characterizations, cohesion and continuity.” (Steenbergen 2008)

Marot (1999) argues that the resurgence of landscape architecture in France took place, because landscape architects started approaching the leftover spaces “areas in-between that were neglected by architects and planners”. This situation can be compared to other contexts where the field of action of contemporary landscape architects deals with a culturally transformed landscape in a broad sense, which is the contemporary urban landscape. Wall names these areas “new kinds of urban site… ambiguous areas that are caught between enclaves” (Wall 1999). These sites include open areas and functions like increasing tourism and leisure activities but also all the products of the second modernity and all the traces of the communication technologies in the landscape: infrastructure lines, interchange nodes, and the problems generated by them, leftover space, and abandoned industrial areas among others.

Another important link to the idea of the contemporary urban landscape can be found in the studies of the ‘territory’ in the European context. This notion can be traced back to Gregotti’s ‘Il territorio dell’architettura’ (1977) and Corboz’s ‘Territoire comme palimpseste’ (1983)). Later, Corboz elaborated on this issue in proposing the city-territory. He proposes a notion of the territory as project; territory as construction through human intervention, using the Roman grid, which is still present in many areas of Europe, as example. Against the conceptions of the territory as an object or as an object of contemplation through the landscape, Corboz proposes to see the territory as project and process.

Corboz emphasizes that the territory has a form which should be on the agenda of spatial planning and not treated merely quantitatively. This form is the product of a long process of construction and transformation that creates several layers. These overlapped layers should be known by someone approaching the landscape with intervention aims. The same notion of the multilayeredness of the territory and its relation to culture is highlighted by Corner in the introduction to Recovering landscape (1999). He claims that “the construction of landscape is inseparable from particular ways of seeing and acting… landscape is an ongoing medium of exchange, a medium that is embedded and evolved within the imaginative and material practices of different societies at different times.”

The idea of the contemporary urban landscape redirects the focus point of the design approach to areas that were formerly not so much taken into account in the design tasks of urban designers and planners. This approach deals with infrastructure, open space, new rural areas, industrialized agriculture, leisure, and with processes of transformation, not only in terms of the built elements. It enlarges the perspective on the contemporary city, showing new important aspects which are potential design tasks. This research sees a great contribution from this approach in the sense that it can solve the exhausted opposition city-countryside, open-built space. This approach is also the most operational in the way it creates a very direct link with practice in the contemporary urban landscape.

2.4.8 The omnipresence of the Urban and the city as community or state of mind

While the previous sections discussed a new type of city, Lerup (2000) focuses on a new stage that overcomes the city. In his case, this is very much related to the North American reality and in some aspects is similar to the concepts of exopolis (Soja 1992) and edge city (Garreau 1992) developed earlier in this chapter. What is relevant to introduce in this section is captured in the title he gives to his book: ‘After the city’. “The European metropolis-without-crowd has skipped westward while radically transforming itself into a new creature, leaner, meaner, and more superficial but harder to catch, at once simpler and less bearable to live in” (Lerup 2000).

In Choay’s ‘reign of the urban and the death of the city’ (1994), in which she elaborates on Webber’s ‘post-city age’ (Webber 1968), Choay explains how communication has created a network that reaches everyone whether they are in a village, suburb, central area or rural one. This network conditions urban mentality independent of location or proximity and it is what she calls ‘the urban’ (l’urbain). Within the idea of new totalities where boundaries are difficult to define or do not exist, we talk about the urban influencing everything, an urban world, and we can also talk about the disappearance of the city.

There is also the idea that everyone constructs his own city by selecting from what the city has to offer and moving between their selections with the aid of the infrastructure network. Two examples illustrate this idea; one is Neutelings’ ‘Carpet metropolis’ (1989) and the other is Fishman’s ‘City a la Carte’ (1990). They do not show the large extension of urbanized regions but the way everything is part of the new urban structure and the way users just construct their own city from different parts in an ‘a la carte’ way.

For example in the “Atlas of change” of the Netherlands (Baart, Metz et al. 2000), interviews, maps and photographs describe ‘the urban Netherlands’; the way all spaces, including open ones are part of that new totality. For example, agricultural areas become tourism destinations, corridors go across territories independent of boundaries and existent urban areas. In the case of
the Netherlands, from this perspective the countryside, the landscape, the agricultural and production zones are now all artificial and designed, and they all take active part of this new totality, the urban Netherlands, and even beyond, since some of the examples also show cross border cooperation and interventions.

In summary, it seems that after so much deliberation and attempt to conceptualize what the city became, while it is rapidly changing, we can see how definitions suggest, as Park did in 1925 (Park, Burgess et al. 1925), that “the city is, rather, a state of mind, a body of customs and traditions, and of the organized attitudes and sentiments that inhere in these costumes and are transmitted with its tradition.” In the same way, much later Lootsma (2000) writes that the metropolis is a ‘new form of community’. The new totality does not have boundaries or clear spatial definition. It is a city different for each of its inhabitants. It includes the areas where we work and live but also where we go on weekends, shop and even take our holidays, as well as our networks which are maintained mainly via the internet. All these spaces are not contiguous anymore and they might be very distant in space but they become close by technology and communication. "…the Metropolis is not simply a matter of form or an addition of more of the same. It is a mental state, a way of life and a new form of community” (Lootsma 2000).

2.4.9 Comparative observations of the vocabulary review

General observations
The views which were looked at in the previous pages suggest that there is a common understanding of the degree of transformation the city has experienced, the dimension of that transformation and the mutation into a stage where everything is affected by the urban, an urban world. Almost all the terms of the reviewed vocabulary refer to a common point, the rapid advance of urbanization, the ever increasing inclusion into the metropolitan logic of distant areas, and the overwhelming contemporary urban condition, affecting all aspects of human life. These studies also coincide in describing the social, economical, political, technological and cultural conditions of the second modernity as the background of these transformations. What we see in the evolution and development of the different terms of this vocabulary set by theoreticians and practitioners of the urban disciplines is the attempts to observe the influences of these changes in the urban sphere.

Investigating and examining these terms and attempts show that one thing is certain now with the start of the twenty-first century: the traditional city, the main subject of urban studies in the past century, is only a small part of what urban research and design should be concerned with today. We could even say that it does not exist anymore in reality, or at least not in the same way that we thought. When looking at all these attempts, new conceptualizations and terms, we can see that the complexity of the contemporary city is the umbrella concept. This complexity is described partially with all these different approaches. Each developed concept, each new approach to understand the complexity of the city, does not cancel the previous one; on the contrary, it brings a new dimension to its understanding.

Different viewpoints
After looking at these concepts, it is possible to identify different approaches and emphasis in analyzing and understanding the transformations of the city. These approaches are in some cases of a more scientific type, supported with data analysis and comparisons and in general with quantitative features, this is for instance the case with the ‘world city’ or the ‘Polyropolis’ (Hall and Pain 2006). Others are more design oriented, emphasizing spatial characteristics and transformations such as ‘Ladders’ (Pope 1996) or the ‘X-urban city’ (Gandelsonas 1999). While some are emphasizing a concept, like ‘world’ and ‘global’ city, others are clarifying the function of these new terms as metaphors: for example, the ‘network’, the ‘quantum’ or the ‘bits’.

Some of the names emerge from the analysis of specific cases, and are generalized afterwards. This is done by stating conclusions at a general level or by identifying similar conditions in other cases; for example, Megalopolis (Gottmann 1961), for the north-eastern seaboard of the United States or Zwischenstadt (Sieverts 2003) for areas in the Ruhr in Germany. In contrast, concepts like the ‘generic city’ (Koolhaas 1995) specifically refer to that uniformity between different contexts and a type of city, developed rapidly by the market in the periphery of any city, that could be found anywhere in the world.

Finally, several of the quoted studies end up proposing a strategy of intervention such as Netsztad (Oswald, Baccini et al. 2003), Zwischenstadt (Sieverts 2003), ‘Splintering Urbanism’ (Graham and Marvin 2002) and ‘Quantum city’ (Arida 2006). They propose a set of actions or an agenda to plan and design within the urban condition which they have previously explained. In some cases, this strategy for intervention is based on the same metaphor or language they have proposed to analyze the current situation. On the contrary, other terms like ‘Generic city’ (Koolhaas 1995) or ‘Cybercity’ (Boyer 1996) reflect the limitations and almost impossibility that the current condition of cities imposes on the attempt to affect it from the spatial practices.

Two positions about the materiality of the city
Across all the review, two different positions in relation to the form of the city emerge. In the first place, some authors affirm that most of the transformations of the contemporary city due to the new communications technologies and individualization are not perceivable in the materiality of the city. This can be because of invisible networks that
affect the relation between the individual and the city but the form of the city. For example, Castells (2000) affirms that “the global city is not a place, but a process”. Graham and Marvin plea for “a networked urbanism that emphasises relations and process rather than object and forms.” This also deals with their affirmation that questions of time have become more important than questions of space. “It seems that time has become an even more important strategic variable than space, despite soaring real estate values from London to New York or Tokyo” (Picon 2003).

An important idea that can be linked to this viewpoint is the existence of different cities for different inhabitants. The idea of the city rather as a community or state of mind than as physical space relates with the fact highlighted by some authors that everyone composes its own city from the pieces he/she needs (Fishman 1990; Lootsma 2000; Neutelings 1989).

However, other authors argue that the initial believe that telematics was going to dissolve the city completely and to make less relevant topographical and geographical space is now just a myth. As it has been already pointed out Sassen held that those discussions ignore the other part of the influence of new communications technologies and globalization on the city. She explains for example how “it is precisely the combination of the spatial dispersal of numerous economic activities and telematic global integration which has contributed to a strategic role for major cities in the current phase of the world economy” (Sassen 1998). As Corner (1996) argues, “an argument for process ought to recognize the profound effects form, space and materials exercise upon the world”.

This research agrees with that position, in recognizing that the spatial implications of the current global condition need to be investigated. While there is of course layers in the contemporary city from which many are not related to physical space, this does not mean that physical space becomes less important. As we saw in the presented review, at a more general level, most of the reviewed authors accept that the changes in the city also generate a reorganization of the territory. It is particularly those changes, traces in the territory of the transformation at many levels of the contemporary city, which this research aims to identify.

Finally, from these texts, we can extract a set of terms that capture the new spatial features of the contemporary city. We can look for these themes in the case studies as well as in the review of the existent studies in order to conclude about general formal characteristics of the contemporary urban landscape, which is the primary aim of this research. The following paragraphs formulate them.

**Some spatial features from the vocabulary**

- **The new role of open space:**
  Many authors (Pope 1996; Sievert 2003; Waldheim 2006) coincide in affirming that the open space is the new binding element of the contemporary city, rather than the built space which was the binding element for the traditional city. Because we do not talk about one central city anymore but about many centres, we do not talk either about a continuous constructed entity but about different degrees and densities of construction all tied together by continuous open space. Similarly, built concentrations are interwoven with empty areas which respond to the demand for functions like tourism and leisure.

- **In-between areas and leftover space as new design tasks:**
  When we study the dispersion of occupation and the dispersion of functions in areas outside the traditional centres, all facilitated by a great accessibility which causes that dispersion or generates re-concentrations outside the traditional centres, we see the appearance of leftover spaces and empty areas between developments and between the elements facilitating that great accessibility. These areas are not empty but contain a variety of functions, sometimes not compatible between each other; functions that the central city cannot accommodate. In many cases they are located between borders of different types spaces that have influenced their particular development. They become the new sites and the new design tasks for the spatial disciplines within the contemporary city. For example, Pope argues in Ladders; “the characteristic spaces of the contemporary city are not identifiable entities, but rather are absences, gaps, lacunae, hiatuses, or ellipses that our commodity-bound works, building and “places” are unable to account for.” (Pope 1996)

- **Boundaries, borders**
  The appearance of new scales, like the world scale, which started influencing the city to a great extend, brings forward the issue of borders. In spatial terms, continuous urban extensions trespass administrative or political borders. Similarly, large open areas become shared by different administrative and political localities. Moreover, many of those in-between areas mentioned above appear specifically in areas between borders which are sometimes left aside in the planning documents. In this sense, the study of borders becomes very important. At a more detailed scale, the simple border between city and countryside does not exist anymore, it has become blurred or even an obsolete idea when we think about the overwhelming influence of the urban.

- **The ground and the territory:**
  In relation to the idea of the open space as the binding element of the contemporary city, some of the authors (Corboz 1997 (1983); Steenbergen 2008) highlight the importance of incorporating the study of the structure of
the ground and the territory into the study of the city. The ground and the territory act as unifying concepts for all different types of occupations and densities in the city as well as for unbuilt areas. On the one hand, the structure of the ground appears as an underlying layer under the built and unbuilt. On the other, the structure of open areas is also manipulated and transformed under the influence of the city.

- New uses, new types and new sites
This theme is related to all the non built space incorporated into the dynamics of the contemporary city. This space is being filled up with new uses most of them related to economical activities like logistic or distribution centres, or to leisure. At the same time, while new technologies create new uses, they render others obsolete. We find for example ruins of industrial sites and in general the phenomena of shrinking cities studied by many scholars (Corner and MacLean 1996; Daskalakis, Waldheim et al. 2001; Oswalt 2005; Oswalt and Rieniets 2006). The new uses are mainly related to leisure and logistics, and the obsolete ones are interrelated and become new tasks for urban designers.

- Infrastructure and Networks
Some of the most important elements of the contemporary city are the different networks connecting different areas, cities, regions, etc. This is the main theme facilitating distant relationships and the dispersion of activities (Dupuy 1991; Graham and Marvin 2002).

- New centres and new relations
Because of flexibility of location allowed by mobility and connection networks, the spatial configuration of cities re-adjusts. These networks allow for dispersion but also re-concentration, creating new centres that behave in different ways and show different formal and spatial characteristics than the traditional ones.
This part is called meta-mapping because it is about mapping with which we review the existing literature dealing with the form of the city and the landscape. The approach, as stated in the methodology, is to look at the existing literature by looking at the contexts of the mapmaker and of the map, where it is the intention behind drawing the map, the context of other contemporary maps and the techniques to produce the map which are important. Using this approach, the chapter 3 will deal with the traditional three schools of morphological studies and the Dutch approach and the chapter 4 will review the recent studies of the landscape and the territory.

The approach developed from the map theory also shows that we need to analyze the context of other maps. Because of this, the chapter 5 deals maps produced in the same period than those about the form of the territory and the landscape dealing with different subjects. This is an attempt to develop a map of the recent large production of maps within urban design.

Finally, Chapter 6 offers a summary of the main insights which were taken from the reviewed studies and are relevant to the main aim of this research, while it clarifies how these aspects will be used in the case studies.

This Part 2 should be observed as a unity. Each chapter (3, 4 and 5) reviews different types of studies with maps, using the same criteria. The conclusions from these three chapters form chapter 6.
Chapter 3.

The urban morphology tradition

This chapter concentrates on the traditional studies of urban form. The context of the mapmaker, the context of the map and the techniques of the different schools will be examined. Since the traditional urban morphological study is already consolidated within urban design and geography, the three main schools of that tradition, Italian, French and British are reviewed. Additionally, the studies within the Dutch context are incorporated as an extra school because they show different viewpoints and techniques which can be very useful for this research. In reviewing the studies of urban morphology, the possible elements, concepts or techniques that can be useful to study the morphology of the contemporary urban landscape will be sought and searched out.
Figure 3. From Muratori, S. (1960). Studi per una operante storia urbana di Venezia, the scale of the city (above), the neighbourhood (left) and the parcel and building (right).
3. 1. Three schools

It is impossible to write about the tradition of urban morphology without referring to specific schools that have engaged these types of studies. Moudon (1994, 1997) Koster (2001), and the ISUF refer to three main schools in the study of urban morphology: the Italian, French, and British Conzenean school. Because these have the most consolidated approaches to urban morphology, they will be reviewed here based in the approach defined in the methodology. The idea is not to give a complete review of each of them, but to investigate their possible application to recent urban forms.

We can start by recalling the three principles on which morphological analysis is based which Moudon (1997) has identified as common to the three schools: form, resolution and time. Form refers to the three physical elements that define urban form: “buildings and their related open spaces, plots or lots and streets.” Resolution refers to scale in the sense that morphological studies cover all the scales of the built landscape at different levels of resolution. Moudon identifies four levels: the building/lot, the street/block, the city, and the region. Finally, the understanding of the dimension of time is essential for morphological urban analysis. Only in a historical dimension, transformation and permanence can be observed. Through the study of the main elements of form in different periods, it is possible to reconstruct the process of occupation of an area, identify typical configurations for different periods and elements that remain constant through transformations (Moudon 1997).

Under these three principles, Moudon argues in her articles and case studies that it is possible to study any urban form. In this context, these principles can constitute the starting point for the case studies. However, the different schools and the specific studies in different urban areas can offer more detailed tools to study the form of the contemporary city. That is the aim of the following review of the three main schools and the Dutch one.

3. 2. The Italian school

The Italian school was established first, and studies of other contexts were influenced by their pioneering work, especially the studies by Muratori of Venice (1960) and Rome (Muratori and Bollati 1963), Cervelatti and Scannavini (1973) for the restoration of the historical centre of Bologna, Caniggia in Como, and the writings and design projects of a generation of Italian architects, with Rossi and Aymonino in the lead. These would spread out the ideas and the discussion internationally. The Italians were the first to develop detailed typo-morphological studies.

The Context of mapmakers

These studies were framed as a reaction to the predicaments and forms of intervention of modernism, which was based on intervention on the scale of the master plan (a ‘tabula rasa’) and it opposed the logic of the way the city had been constructed over time and the traditions of previous periods. This was leading to the deterioration of historical city centres while creating a type of urban environment contrary to the logic with which the city had been constructed for centuries. According to Muratori, ‘Modernism discarded the inherent knowledge of construction, seen as a system, and reduced architecture and urban design to simple technical matters’ (Marzot 2002).

According to the Italian school, architecture and the city as architecture should be understood in the dimension of time. For this reason, it was necessary to look at the historical transformations of urban areas to understand them as a product of a collective and historical construction. Furthermore, their contemporary validity was demonstrated by that decantation and the permanence, adaptation and transformation through time. In this way, architects should acknowledge their existence within this line of collective construction in order to produce new design proposals.

The Aim of Mapping

Muratori advocated the need to study the way the city and architecture had been constructed through time, on all different levels (scales), in order to “find the laws of continuity within a transformation process” (Marzot, 2002). Caniggia developed this idea further in the ‘Typological Process’, which refers to a degree of continuity in form, as each period in history inherits the building types and form of the previous ones, but it transforms and adapts them in contemporary ways. In this sense it is important to note that, even though Muratori and Caniggia discussed different scales of the built environment, their observations concentrated on the building type, which is considered the basis for the formation of the urban tissue and of the city.

Especially for Muratori, Caniggia and their later followers, the historical city was seen as a source for development of design approaches. Moreover, by studying and re-interpreting traditional types, they were making an “attempt to build a theory of design based on traditional processes of city building” (Moudon 1994). Muratori titled his studies of Venice and Rome ‘operative histories’. This can be referred to ‘operative criticism’ as one of the ideas that identifies this Italian approach. “What is normally meant by operative criticism is an analysis of architecture that, instead of a abstract survey, has as its objective the planning of a precise poetical tendency, anticipated in its structures and derived from historical analyses programmatically distorted and finalized” (Tafuri 1980).

While Canniggia and Muratori focused on the idea that design interventions and designers should follow the lines encountered through the historical studies, Rossi and
Figure 4. From Fortier, B. (1989). La métropole imaginaire; un atlas de Paris, left: Rue Réaumur (1897-1903, 1897-1898, 1898-1900, 1904)

Figure 5. From Lucan, J. (1996) Paris des faubourgs : formation, transformation

Figure 6. From Panerai, P. (2008) Paris métropole : Formes et échelles du grand-Paris, Le Blanc-Mesnil, street pattern (left0, tissues urbains (middle), progressive densification of the pavilion pattern (tissu pavillonaire) (right).
Aymonino aimed their attention at the designer as the person with the plans and the ability to decide what to do in relation to the historical models, since his design had to be contemporary. For Rossi, it was more important to define an autonomous architecture in which architectural form and space could be understood from within the field of architecture without needing to recur to other disciplines to explain it. In ‘The Architecture of the City’ (1982), Rossi spoke about permanencies or what he called primary elements or the monuments in the city, and from these, he developed the idea of autonomy of the architectural form from function.

Applications to the contemporary urban landscape
Muratori and Caniggia’s emphasis in the building type seems to limit the possibilities of studying urban form in areas where it is the open space rather than the built one which binds an area. What we can extract from their ideas to learn about the contemporary city has to be at a more abstract level, in the idea of finding laws of continuity within a transformation process. We can follow this idea to find elements of continuity in the current situation with previous periods dealing with the way urban evolution generates building types inherent in its contemporary conditions.

Today, for example, we have mobility nodes, business complexes, and shopping malls. But we can look back at their historical evolution and the origins of the different formations that are typical of contemporary urban territory, because they may not be totally new. The statements by Muratori and his followers maintain much of their validity and reinforce the idea of the need for ‘describing’ the contemporary urban condition. In a projective discipline such as architecture and urban design, knowledge of the transformations that have produced current conditions is necessary to plan and design the future.

3. 3. The French school

The Context of mapmakers
The second approach is that of the French school. The adherents of this group formed around the Versailles School (LADHRAUS), but they expanded to various areas in France. This group includes a considerable group of scholars from several disciplines such as architecture, urbanism, sociology, history, and geography. As Cohen relates it in his article ‘The Italophiles at Work’, (Cohen 1998) the Italian discussion entered the French context.

The Aim of mapping
in view of several detailed studies of urban areas in France and other urban locations in the world, especially in North Africa, the French have developed more theoretical and methodological reflections on the motivations for studying typologies, growth, and the evolution of elements through the history of the city. They are interested in developing analyses of existing urban forms and areas to confront the constructed reality with the planned and designed, and consequently, the ideas and theories behind specific types and forms of urban developments. They developed a type of ‘design criticism’ ‘to assess the impact of past design theories on city building’ (Moudon 1997), or as expressed in Analyse Urbain, ‘to study the idea of the elaboration and transmission of the architectural models.’ The various ideas of the city that repeatedly return or are re-interpreted produce different types of urban reality with different spatial characteristics. By studying this confrontation, the French aim to assess the realisations of various theories as well as the various types of urban form and patterns, and thus to identify their characteristic elements in order to re-develop them in new interventions. For example, the comparative studies of urban patterns (or traces), the study of the evolution of the urban block (‘l’ilot’) or of the relationship building-parcel are studies in the influence of models in the dissolution of the basic element of the XIX century city, the closed building block.

Important studies like the Atlas of Paris (Fortier 1989) belong to this French tradition. This Atlas traces the transformations of representative parts of Paris and it is aided by detailed reconstruction in sequences of maps. The precision and the level of details of the maps allow comparison and drawing conclusions about the transformations in the structure of the city, in relation to the changes and permanences. The main question is how the city is constructed and transformed; which elements have remained through transformations and why. Finally, another important aim of these studies, which they share with the book Analyse Urbaine (Panerai, Demorgon et al. 1999), is the attempt to establish some bases for a method of analysis. As stated by the authors, the goal of the book is “providing some elements and methods to apprehend the contemporary city.”

10 Author translation. Original quote: ‘d’aborder le phénomène urbain par les propriétés formelles de l’espace’
Figure 7. From Conzen, M. R. G. (1960) Alnwick, Northumberland. A study in town-plan analysis.

Figure 8. Fringe belts in Newcastle upon Tyne From: Withehand (1992)
Applications to the contemporary urban landscape
The notion of ‘tissue urbain’, which is of great importance for the French studies, seems to offer possibilities for making a generalization that can be used for studying recent forms. Tissue urbain is constituted by the networks of streets, the land divisions and the buildings. These elements explain the cohesion and homogeneity in different city areas. What is important in relation to these studies for this research, as Moudon (1994) argues, is that while the Italians identify an ‘after and before’ the ideas of modernism in the city, and therefore concentrate in studying the ‘before’ period, the French have also looked closely at the city of modernism. They consider the idea of evolution in patterns, types and forms for which modernism stands along one of the lines of this evolution, and in which the historical is not only homogeneous type of city but compiles a variation of types and models that evolve in different directions. They are interested in the development and diffusion of different architectural models.

It is important to mention the way scholars within this French tradition are concerned with studying the transformation of the contemporary city. In the new edition of ‘Analyse Urbaine’ (Panerai, Demorgon et al. 1999), the authors include the metropolitan scale, looking at infrastructure networks and studies of the periphery. As explained by Panerai in the introduction, the actualization of a document of ‘analyse urbaine’ lead them to replace the historic cities by their actual state and to enter the metropolitan scale and the patterns characteristics of recent urbanization. Stating the necessity to approach the contemporary city and the metropolitan scale but also the difficulty to do so, the authors study the picturesque. They start by looking at the great axes or highways, where the experience of the landscape is organized in three levels: the immediate landscape, the lost territory and the territory historically constituted. The way the infrastructure in the periphery constitutes in some cases a break in the continuity of the landscape and big islands like industrial complexes or airports constitute a change of scale which is not possible to apprehend in the same way, but can be only understood by means of cartography. Cartography which is “selective (and) brings into evidence the dimensions and positions and allows comparisons, reveals traces and permanences.” Finally, this publication shows that the statements made in the 80s can be actualized for studying recent developments. The elements developed by the authors into a formulation of a method, growth, typology and urban tissue are fruitful to look at the contemporary city. At last, the call to study the experience of the landscape and the practice of the urban space as complementary to the morphological one coincides with other authors that will be studied in the next chapter.

Similarly, in ‘Project Urbain’ (Mangin and Panerai 1999) different types of tissues, traces, densities and urban blocks of the contemporary city are studied and compared. Recently, Panerai published ‘Paris Metropole’ (2008), where he studies Paris at the metropolitan scale or the Paris agglomeration. Panerai attempts to apprehend that agglomeration of Paris in which the central Paris, the old city, occupies only 5 percent. This agglomeration functions with new forms which he aims to research. His study looks at different types of densities within that agglomeration and the way borders and scales have been enlarging that agglomeration. The question is how to conceptualize it: as many centres, as a concentric one? And how to govern it? Similarly, Mangin in the ‘Ville Franchisée’ (2004) studies the large expansion and dissolution of the borders of the city and the developments that are the product of the automobile and of individual decisions. Mangin, like Panerai but in opposition to other authors which claim the impossibility of control, aims to propose ways to govern and organize those urban extensions which, as he shows with international examples, are nowadays to be found everywhere in the world.

3. 4. The British, Conzenean school

The Context of mapmakers
The last tradition, which had its origins in the field of geography, harkens back to the German morphogenetic tradition which influenced M.R.G. Conzen. He developed a tradition of morphological urban studies for the British context beginning in the 1930s. Conzen did this by using several town plan analyses, the most important of which was for the city of Alnwick (Conzen 1960). In the case of Conzen, his ideas and the way he developed them further in England into town plan analysis are much influenced by the context in which he studied geography. He first studied in Germany where he was influenced by the morphogenetic tradition with works by Schulner and others. From these, Conzen obtained ideas that he would developed much further about the ground plan of towns and the lecture of its historical development. Furthermore, as observed by Withehand (2001), the emphasis given by Conzen, as well as his followers on cartographic representation is the product of the context in which Conzen developed his ideas about urban morphology, something which would also later influence posterior studies by other scholars in England.

The Aim of mapping
Moudon (1997) affirms that there is a big difference between the reasons for engaging in urban morphological research from the architecture and urban design side (Italian and French schools) and from the British school which originated within geography. The last one has as main aim to explain how and why a city is built in a certain way and it has less prescriptive purposes. Its aims are, according to Moudon, “descriptive and explanatory... with the aim of developing a theory of city building” (Moudon 1997). However, Conzen did believe that the maps produced of the different morphological regions could be of use for planning. As Withehand points out, “it provided a basis for rooting the future management of the urban
landscape in its historical development” (Withehand 2001). One of the examples of Conzen’s approach to planning is the study of Whitby (Conzen 1958) which constituted the basis for a plan for the town. Recently, another aim of a large amount of studies within this school is to examine the influences of decision takers and urban form.

Applications to the contemporary urban landscape
The attention given by this approach to consolidate a general knowledge and to precisely define concepts for the plan analysis makes it a rich source to understand the form of the contemporary city. In general, these studies examine what Conzen called the ‘townscape’, which corresponds to a combination of the town plan, building forms, and land use. The town plan contains “streets and their arrangements in a street system, plots and their aggregation in street blocks, and buildings, or more precisely their block-plans” (Whitehand 1987). The homogeneity in this combination defines what Conzen calls “plan units” “an individualized combination of streets, plots and buildings” (Conzen 1960). The concept of plan units is very relevant for this research since its definition in the various morphological periods also includes areas that are not completely urban, or are not totally homogeneous. The plan units cover the entire extension of an area, including agricultural or functions other than the residential. In this instance, we refer to examples from the Alnwick study, such as the medieval suburbium, a pre-urban settlement outside the walls.

Another important concept is the ‘fringe belt’. It was developed initially by Conzen and enriched later by Wittehand (1987) who created a link between the emergence of fringe belts and economical cycles. This concept explains urban development in relation to cycles. Within these cycles, when there is stagnation or low dynamic in the residential expansion, fringe belts appear. Fringe belts are areas contiguous to previous residential expansion that start accommodating different functions, usually functions that require bigger surfaces or are otherwise incompatible with the residential, like industry, universities, hospitals. These areas are visible when studying the history of the urban development of cities and they might become borders to urbanization that at some point are trespassed but that maintain a particular less-articulated and integrated pattern in relation to the dense residential pattern. In relation to the contemporary urban landscape, viewed from the point of view of its physical and spatial characteristics, the notion of fringe belt can be used to observe how areas of occupation of big functions, or semi-rural areas are located in-between areas of compact residential developments.

3.5. Studies in the Netherlands
The studies from the Dutch context are included in this review, even if they are not generally considered within the traditional schools of urban morphology, because they also look at urban morphology but incorporate different elements that are of interest for this research and that have not been addressed by others. One of these elements is the layered approach, including the landscape and structure of the ground. However, its diversity and the fact that a lot of the times analyses are developed with the direct objective of a design project, or within the education context, might explain why it has not spread internationally as much as the other schools of urban morphology. One line of these studies is concerned with the landscape, this is better known internationally and will be described separately in the next chapter.

The Context of the mapmakers
Historically, the discussions about urban morphology in the Dutch context originate simultaneously with the discussions in the rest of Europe (along the 1970s). They were also influenced by the Italian Tendenza. In a conversation with R. Geurtsen11 he revealed how the Italian studies but also the contact with Spanish scholars like Busquets and Sola Morales influenced his activities in Delft. F. Palmboom12 has pointed out the LOTUS magazine, divulging Tendenza, the studies in the Spanish context, and architects like Krier and Ungers as very influential in Delft. However, the Dutch approach has also local origins and influences. At the faculty of Architecture at the TU Delft, the involvement of people like Aldo van Eyck in education, the discussions in the magazine ‘Delfse School’, and the organization of the exhibition ‘Autonomous Architecture’ initiated the debate and called attention to the study of form in architecture.

Contrary to other cases, the Dutch did not develop many detailed typo-morphological studies but they used the same approach more in relation to design. For example, Panerai and Mangin quote Van Eyck’s project for the Jordaan in Amsterdam (1972-1980) and Waterstraat-Bitterstraat in Zwolle (1971-1975) as presenting already some characteristics of an ‘Urban Project’, because of the relationship to the existent fabric, pattern and parcel structure and the composition of the open spaces and built types (Mangin and Panerai 1999). We could say then that what arrived to the Dutch context was the message that these studies were carrying, as a new attitude against the function and programme totally determining the form and against the tabula rasa, and in favour of an attention and study of the historical city. This general idea was framed within a contextualist13 approach which dominated the thinking about the city at that time, as reaction to modernist ideas.

11 R. Geurtsen was teaching at that moment in urban design at the faculty of Architecture at TU Delft. He is co-author of the LAS book. Date of conversation: 13-04-2004
12 F. Palmboom was graduating then from the faculty of Architecture at the TU Delft having studied with A van Eijck and M Risselada. He is author of ‘Rotterdam, verstedelijkt landschap’ (Rotterdam, urbanized landscape) (1987), among other things. Date of conversation: 05-12-2003
13 Some of the predictors of this contextualism in the European context, besides the Italian and French schools already mentioned, were for example the Krier brothers.
In relation to the ‘morphological urban analysis’, in the faculty of Architecture at the TU Delft discussions start taking place on form in architecture. The faculty had been until that time guided by orientations mainly towards functionalism or traditionalism. This debate can be followed in the organization and further presentation of the exhibition ‘Autonomous Architecture’ (1962), as well as in the magazine ‘Delftse School’ (first number in 1961) (Heuvel, Steigenga et al. 2003). In the faculty of Architecture at Delft, one of the products of this discussion was the development of ‘Plan analysis’14, which became very important for the teaching and research in the department of Architecture from this time on up until now (Heuvel, Steigenga et al. 2003). “In the Architecture Department of the T.H. Delft a start has been made, around 8 years ago, with a more conscientious, methodical analysis of architectural material: plan analysis”15 (Stylos 1981). “Simultaneously plan analysis was developed, a form of research investigating the design as result of a process in which particularly the approach and design method of the designer were central. This research focuses on the naming and clarifying of essential features in the spatial composition which cannot be explained directly from side conditions or program, but which have to do mainly with the specific position and method of the designer”16 (Meyer 2003)

Even though this discourse was at the beginning more concentrated in the department of architecture, people like Rein Geurtsen brought it to the Urbanism department (Döll 1981; Meyer 2003). Plan Analysis and more generally speaking, historical morphological analysis, became then normal practice in the department, as part of the design process but also as independent studies of urban areas. The decade of the 80s was a decade of production of a large amount of analyses of different urban areas, most of them historical centres of locations in the Netherlands and in other parts in Europe that were published in magazines like Wonen TA/BK. The LAS book (Geurtsen, Leupen et al. 1990) was a compilation of this approach and used in teaching, accompanied by examples of various architectural, typological, morphological urban analyses and showing the overlapping and common points between the different disciplines, Landscape, Architecture and Urbanism.

The Aim of Mapping
The studies in the Dutch context have a clear design orientation. This can be read in two directions. The most common studies are often an analysis of a specific area which leads to a design, vision, or scenario for that area. The second does not directly need to deal with design but it deals with understanding designers interventions. In the TU Delft for example, it is of great importance in the curriculum of architecture as well as urbanism in both of the explained directions. In the preface to the 1990 edition of the LAS book, Leupen describes the objective of the handbook: “a toolbox for the analysis of spatial objects at all scale levels from the house and building to the city and region”. This tendency towards analysis through maps that precedes design is also clear in the design practice. As explained in “Lessons” (Heuvel, Steigenga et al. 2003) architecture and urban design offices nowadays have been educated with “plananalyse” and this is perceivable in their projects.

Finally, there is a clear recognition of the role maps and drawings play in analysis of a location. In “Design and Analysis” the appendix dedicated to drawing techniques to aid the analysis point to “the analytical drawing as a way to obtain insight into the process of designing” (Leupen 1997). The techniques described at the end of the book: reduction, addition, and démontage are used to extract from the plans of projects and urban areas the essential aspects which depend on the analyzed theme in order to reveal certain logic and structure through the drawing process.

Applications to the contemporary urban landscape
There is no clear definition of elements, concepts or techniques in what the Dutch approach accounts for. The following paragraphs are an interpretation based on a comparison between several analyses of specific cases from which some general ideas were extracted. These ideas are included here because they offer potential tools in the study of the form of recent developments.

The important elements in the urban morphology studies within the Dutch context are not as much related with typology or classification, as with understanding the specific spatial characteristics of a site and representing them through abstraction drawings and maps. The spatial structure of an urban area that is uncovered and represented through morphological study in the Dutch case involves more than purely morphological aspects. It involves elements from townscape or perception inspired by Kevin Lynch’s ‘Image of the city’ and Cullen’s townscape among others. It involves representation of paths or main connecting routes combined with representation of primary elements or monuments as important elements in the configuration of such structure. These elements are mapped in reduction drawings that attempt to represent the spatial structure of the studied area. The way the spatial structure of an urban area is

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15 Original version in Dutch: “Op de Afdeling Bouwkunde van de T.H. Delft is zo’n 8 jaar geleden een begin gemaakt met meer nauwgezette, methodische analyse van architectonisch materiaal: Plananalyse” (author’s translation)
16 Original version in Dutch: “Tegelijk was de plananalyse in ontwikkeling, een vorm van onderzoek die het ontwerp onderzocht als resultaat van een proces waarin met name de werkwijze en ontwerpomgeving van de ontwerper centraal staan. Dit onderzoek spitst zich toe op het benoemen en verklaren van essentiële kenmerken in de ruimtelijke compositie die niet direct uit randvoorwaarden en programma verklaard kunnen worden, maar eerder te maken hebben met specifieke opvattingen en werkwijze van de ontwerper” (author’s translation)
recognized and represented in the Dutch case can be clearly observed in the analyses of Groningen, Nijmegen and Breda (Geurtsen, Leupen et al. 1990), while the study of different homogeneous areas appears in the analyses of Copenhagen and Delft (Geurtsen and Bos 1981; Geurtsen 1988) and in the study of Amsterdam by Louwe and van der Hoeven (1985).

However, in the last example of Amsterdam’s study by Louwe and Van der Hoeven (1985), the authors refer to a difficulty they encounter when mapping the last period of their study, the AUP plan by Van Eesteren and specifically the Westelijke Tuinsteden. They affirmed that the type of abstractions they had used to analyse the previous periods were not suitable to study the last one. However, the book does contain maps of the Westelijke Tuinsteden. In this regard, Bekkering claims that “one could argue that Van der Hoeven and Louwe did not find a way to draw and explain the formal structure of the modern city, as some of their drawings do give immediate insight into its structure. But they are right on concluding that these drawings look completely different from those of ‘the other kind’ of city, i.e. the traditional city” (Bekkering 2008).

The Dutch studies also emphasise the identification of patterns, based on a study of the ground plan in the actual situation and in a historical perspective. The recognition of patterns defines ‘homogeneous areas’ that share the same pattern, historical evolution and formal configuration and therefore can be decomposed geometrically and hierarchically to reveal the spatial structure of such an area. The city or studied urban area is taken apart in ‘homogeneous areas’ and each of these areas is studied independently and in their mutual relations. Although this recognition of homogeneous areas is found mostly in examples for historical centres, its idea can be useful to study recent developments.

In recent years, within the Dutch context there has been a large production of new morphological studies attempting to look at recent transformations. Studies like the Atlas of the Dutch Urban Block (Komossa and Meyer 2005) for example, incorporate within a comparison of urban blocks, areas of post-war developments and of developments of the last decades. Other studies concentrate in urban morphology at the level of the Randstad or at the post-war developments and possibilities or their transformation, continuing in a sense on the stage where the study of Louwe and van der Hoeven for Amsterdam stopped. These studies will be reviewed further in the next chapter.

3.6. Context of the map: other contemporary maps

In the study of the context of the maps, Harley and Laxton (Harley and Laxton 2001) give examples of how the study of the context of the map becomes an exercise of comparative cartography. It is important to understand the relation of a specific map to others. In this sense, a comparative observation of different mappings could illustrate this aspect. The three schools of morphological analysis and the Dutch approach will be simplified (or treated) as one group of rather contemporary studies, for the sake of this section. In this way we will look at other maps produced in the same period dealing with subjects different than urban form.

Since the study of urban morphology tradition and the different schools already has produced some generalizations from comparative observations between different studies using maps, what is necessary is to examine other maps contemporary that do not belong to the urban morphology approach. This will tell us something about other themes which were relevant at the same time that the morphological approach was flourishing.

Learning from Las Vegas

We will show three examples of studies with maps developed contemporary to the beginnings of the traditional schools of urban morphology. First, contemporary to the discourse around the city as architecture, but in the American context, it is a study which shows a different context and a new emerging attitude towards the built environment; the study of Las Vegas’ strip by Venturi, Scott Brown et al (1977, 1972). This study maps and researches in dept the old commercial and gambling Strip of Las Vegas in all its characteristics, which are almost opposite to those of the historical centres, deeply researched at the same moment in Europe.

The attention given to an element like the Strip, considered before as non architecture or non city, illustrates a new attitude towards the existent urban landscape which is very different from the one formulated by the morphological approach. As the opening line of the study states, a new attitude is about “learning from the existing landscape” as “a way of being revolutionary for architect” (Venturi, Scott Brown et al. 1977, 1972). In the strip, other elements rather than architecture are fundamental for the experience of the space. “Any sense of enclosure or direction comes from lighted signs rather than forms reflected in light.” “The iconography, rather than the space and piazzas of historical architecture, forms the background for the study of association and symbolism in commercial art and strip architecture” (Venturi, Scott Brown et al. 1977, 1972).

However, this attitude is in essence not very unique, as the second part of the initial line of Learning from Las Vegas states: “Not the obvious way, which is to tear down Paris and begin again, as Le Corbusier suggested
Table 2. Comparative table of traditional approaches to urban form:
This table summarizes specific aspects of the traditional approaches to the study of urban form. It is organized with the same main themes of the review, context and techniques. The last row deals with the main question posed to all the reviewed studies, the possibilities of application in the contemporary city.

<table>
<thead>
<tr>
<th>Italian school</th>
<th>French school</th>
<th>British, Conzenean school</th>
<th>Dutch approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Built object and ‘Dwelling’ are the basic type. The city scale is the basis to understand the historical and spatial identity of the urban form and for further detailed studies in the different housing neighbourhoods there is an evolution in the types inherent to the study of urban form, when they acquired their final morphological type.</td>
<td>The Parcell is the minimal unit of the urban space. The permanence of the parcell structure is what maintains the homogeneity of a neighbourhood or district and limits the fluctuations of the types that can be constructed. (Panerai, Demorgon et al. 1999)</td>
<td>Plan Unit: individualized combination of streets, plots and buildings; morphological homogeneity.</td>
<td>The parcel is the basic element of the urban form. Study all scales from parcel to city or region, focusing on homogenous areas, which are areas indenitified by their context and identity.</td>
</tr>
<tr>
<td>Urban tissue: aggregation of building types, surrounding space and access ways. Emphasis on scale of the building and development of building types.</td>
<td>Tissue urbain: constituted by the superimposition or overlap of these sets: -street network -land parcels -constructions: buildings. Identification of types of tissues, building types and types of streets and of open spaces.</td>
<td>Townplan analysis: Study of townscapes -combination of town-plan, pattern of building and pattern of urban land use.</td>
<td>These studies are interested in mapping spatial structure of an area, they do that in all scales.</td>
</tr>
<tr>
<td>Muratori looks from the building to the morphology of the city. Caniggia has as goal the object while the urban transformations are one of the factors that changes that object (Koster 2001).</td>
<td>Through contact with thinkers such as Henri Lefebvre and, in particular Henri Raymond, much importance was attached to various sociological aspects of urban and architectural forms’ (Darin 1998).</td>
<td>Burgage cycle: ‘the progressive filling in with buildings of the backland of burgages and terminating in the clearing of buildings and a period of “urban fallow” prior to the initiation of a redevelopment cycle’ (Whitehead 1997).</td>
<td>Study and definition of the spatial structure of an urban area incorporating ideas of townscapes and Lynch analysis like: pathes and monuments.</td>
</tr>
</tbody>
</table>

| Large attention to the building typology and to developing of detailed classifications and reconstructions. Identification of ‘basic type’, ‘leading type’ or ‘ideal type’: prototype of ideal type: cell of built meter. | Interest in the study of the transmission of architectural models. | ‘Devising proposals for future townscapes management’ (Whitehead 1990). | Study of urban patterns in relation to models and theories of design and planning. |
| Cartographical reconstruction by ways of self scale cultural historical maps of Venice in the gothic, renaissance and baroque times. Archaeological and historical reconstruction of the individual dwelling and the situation (in physical and culture historical sense) in the surrounding neighbourhoods and districts. | ‘To assess the impact of past design theories on city building’ Design criticism (Moudon 1997). | ‘Emphasise continuity between historical knowledge and contemporary action’ (Samuel 2000). | Study of different ideas that have influenced different urban developments. |
| Operative history. Typological process: link between analysis and design. Look for an understanding of the historical process of formation of built forms. | ‘To study the idea of design in practice’ | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Division of urban areas in relation to origin, historical evolution and street and occupation pattern and later, study each of the different areas separately. |
| ‘Attempt to build a theory of design based on traditional processes of city building’: ‘To isolate the fundamental principles of city making’ Identification of the elements and rules that mark the genesis and then the transformation of the city fabric (Mabou 1990). | ‘Identify the ingredients of good city design’ (Mouzon 1994). | ‘Plan Unit: individualized combination of streets, plots and buildings; morphological homogeneity. | Study of different periods of the evolution of an urban area. |
| ‘Prescriptive purposes, with the aim of developing a theory of city design’ (Moudon 1997). | ‘To study the idea of the elaboration and transfer of the architectural models’ (Panerai, Demorgon et al. 1999). | ‘Devising proposals for future townscapes management’ (Whitehead 1990). | Identify structuring elements and the coherence of an urban area. |
| ‘Continuity’: Each period in history inherits the building types and form of the previous ones but transforms and adapts them to contemporary circumstances. According to Muratori; Modernism did not acquire the inherent knowledge of construction, seen as a system, and reduced architecture and urban design to simple technical matters’. ‘Re-establishing a connection between the current and the pre-modern periods’ (Marzor 2002). | ‘Identify the ingredients of good city design’ (Mouzon 1994). | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Analysis generates ideas or tasks for townscapes and Lynch analysis like: pathes and monuments. |
| Basic type: transformed according to changing social and economical conditions, carriers of the historical structure of the city. | ‘To assess the impact of past design theories on city building’ Design criticism (Moudon 1997). | ‘Explaination of structure of a town plan. Townscapes: objectivation of the spirit of a society (Koster 2001). | Study of different periods of the evolution of an urban area. |
| ‘Crossance (Growth): the study of growth plans to see the city as an organism that develops through time’ (Panerai 1980). | ‘To study the idea of design in practice’ | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Study the historical development of cities and urban areas but they also study today’s situation. |
| Types of growth: In terms of spatial distribution (continuous, discontinuous), line of growth, pole of growth, growth in the extent, limit of growth, border of growth, change of the border, densification. | Method: evolutionary approach: tracing existing forms to the underlying formative processes and interpreting them accordingly. | ‘Explaination of structure of a town plan. Townscapes: objectivation of the spirit of a society (Koster 2001). | Studies analyses study of post-war developments where formal and spatial configuration opposes in some cases those of the traditional city. |
| The study of the building block recounts the appearance of the block with the model of the Ville Radieuse. The transformation of the closed building block into an open one which is not anymore an urban block. | ‘Identify the ingredients of good city design’ (Mouzon 1994). | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Study of different periods of the evolution of an urban area. |
| ‘There are not on side a historical city, charming but exceeded, to which a modern city, both from progress and technique is opposed, but two concurrent conceptions of the city that clash today, sometimes over contiguous terrains’ (Panerai, Demorgin et al. 1999). | ‘Explaination of structure of a town plan. Townscapes: objectivation of the spirit of a society (Koster 2001). | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Study of different periods of the evolution of an urban area. |
| Change in time: land use changes faster than the built one. | ‘Explaination of structure of a town plan. Townscapes: objectivation of the spirit of a society (Koster 2001). | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Study of different periods of the evolution of an urban area. |
| Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. Abstraction into a map of aggregated areas where morphological regions are areas with different colours in a legend. | ‘Explaination of structure of a town plan. Townscapes: objectivation of the spirit of a society (Koster 2001). | ‘Historical cartographical reconstruction: Separation of elements - base map, level of detail of the parcel and building. | Study of different periods of the evolution of an urban area. |

Table 2. Comparative table of traditional approaches to urban form: This table summarizes specific aspects of the traditional approaches to the study of urban form. It is organized with the same main themes of the review, context and techniques. The last row deals with the main question posed to all the reviewed studies, the possibilities of application in the contemporary city.
in the 1920s, but another, more tolerant way; that is, to question how we look at things.” The attitude towards the predecessor period of modernism influence in the city is similar to the one from the Italian and French urban morphologists at the same time, namely it is a call to map and document the existent in order to be able to plan and project. While the attitude is similar, the American context, with a different type of city and of historical city generates a different response. “And it is perhaps from the everyday landscape, vulgar and disdained, that we can draw the complex and contradictory order that is valid and vital for our architecture as an urbanistic whole” (Venturi 1966).

Mapping perception

The second set of studies are ‘The view from the road” (Appleyard, Myer et al. 1964) and ‘The image of the city’ (Lynch 1960). They look at and attempt to map the perception of that physical space, the way people experience or apprehend that form and space. This relates also with the way people move in the city, the way people orientate and find their way in it, as well as with the mental maps they have of their everyday spaces.

Lynch is interested in the way the landscape is perceived: “This book is about the look of cities, and whether this look is of any importance, and whether it can be changed. The urban landscape, among its many roles, is also something to be seen, to be remembered, and to delight in” (Lynch 1960). In relation to mapping, Lynch defines the main elements that constitute the image of the city: paths, edges, districts, nodes and landmarks. He develops a convention for the mapping of these elements. Consequently, the creation of a legend allows comparisons between maps of different cities. “What is being mapped here is an abstraction, not physical reality itself but the generalized impressions that real form makes on an observer indoctrinated in a certain way”. The bases for the elaboration of the maps were interviews and fieldwork with the interviewed, as well as maps drawn by them. At the end, the maps which are presented summarize the research and are conclusive of the image of a specific city. Similarly, ‘The view from the road’ (Appleyard, Myer et al. 1964) explores the perception from the new element of the city experience, the highway. In this case, they develop a legend and a way of mapping the image from the movement along the highway, the vision and the elements that are visible or become relevant in this experience.

Making the city observable (Wurman 1971)

Finally, the compilation of ‘visualizations of the city’ by Wurman in 1971 “explores some of the existing data systems which describe, in visual terms, various urban entities”. As the author explains, “it is a collection of gestures towards solutions.” The publication includes all types of visualizations of the city from the bird eye pictorial views of the sixteenth and seventeenth century, to computer-produced graphs. It includes maps reproducing physical and spatial features of cities, maps from city guides, maps consigning data like population densities, traffic flow and incomes, and maps with specific information like subway lines. They are not organized or categorized by Wurman, but are only put together accompanied by small comments by the author about the type of information and visualization of the city of each example, as well as their readability and clarity.

Interestingly it gives the most attention to the idea that the city should be made observable and “information about the public environment should be understandable.” Because of this interest, some of the examples at the end of the compilation are psychological studies of the way we see
cities and they show the existence of groups interested in educating the public about the city. With these examples, Wurman shows how an environment of learning should be created within the city. This interest in the necessity that the city should be observable and become a learning space is clearly formulated in the introduction: "making the city observable implies allowing the city to become an environment for learning." Having clarified this standpoint, we can see that the maps reviewed are then analyzed in terms of the communicability and accessibility to the public while analysis of other aspects is missing.

Other maps, other context
Finally we can make some observations about the maps produced at the same time as those from urban morphology tradition used as example here. These developed all within the North American context and show how a different studied context generates different responses. However, as already mentioned for Las Vegas study, behind them there is still an attitude that embraces learning from the existing. The study of the American city also generates an important new theme not observed by the morphological studies in Europe, namely that of the perception of the city and also of the way to make the orientation in the city clear. Later, this perception is brought to a typical element of the American city, the experience from the road.

Figure 13. Cullen, G. (1961). Townscape

Figure 14. Appleyard, D., J. R. Myer, et al. (1964) The view from the road
Chapter 4.

Mapping urban form, retrospective reconstruction

This chapter reviews the studies in the form of the landscape and the territory that have been produced mainly starting from the 1990s. These studies, mainly in the European context are complemented with studies in the North American suburbia and landscape. The studies are interested in mapping the recent transformations of the landscape and the territory. Themes include the transformations generated by tourism and leisure, industrial sties in disuse, and transformation of agriculture areas between others.

The approach enounced in the introduction, with which the urban morphological traditional was reviewed, is also applied in this chapter. The studies are then examined in relation to the context of the mapmaker and of the map. Furthermore, the main question guiding the review is about the possibilities to extract general knowledge.
Figure 15. From Moudon, A. V. (1986). Built For Change; neighborhood architecture in San Francisco
4.1. Morphology of the North American suburbia

The North American context, around the 1970s was prolific for urban studies involving analysis of urban form through mapping. We already mention previously 'Collage city' by Roewe and Koetter (1978) with the figure ground representation. Bacon’s abstraction drawings and comparisons of the structure of city areas in ‘Design of Cities’ also show a way to abstract spatial structure (Bacon 1974). This section concentrates in the recent studies in the North American context which look at the morphology of the North American suburbia.

Context of the mapmakers

The first set of notable studies dealing with the form of North American suburbia can be contextualized by reference to the contact with the ISUF and the urban morphological traditions in Europe. However, the context in which the studies are realized and the reality of the North American city is very different from those of the European traditional city. The spatial and formal characteristics of American urban expansions, where the large proportions of the urban landscape include extensive suburban developments, have led to the study of these types of developments but with a different emphasis.

While many of the European morphological studies give priority to medieval and historical cities as objects of study, in North America, studies have attempted to look at the formal and spatial characteristics of suburbia and of the new edge cities and megalopolises. Since not all suburban developments are the same, various historic, geographic, and government contexts define different formal configurations, as can be observed in the comparative studies of Southworth and Owens (1993). As it has been argued by Moudon (1998), studying the contexts of suburban America through morphological analysis has been productive, informative, and useful for planners as well as actors and users, since the processes observed in historic towns are also present in such contexts.

In time, the North American studies, initially very much linked to the contact to the traditional morphological schools, followed a line of their own. They have incorporated quantitative information in their studies of spatial and formal aspects. This has recently been enhanced by the developments in Geographical information Systems. They see in the possibilities of data linked to parcels that GIS allows, an opportunity to look with morphological eyes at large extensions of urbanization as seen in the North American agglomerations. As Moudon (1997) notes, “for the first time, then, urban morphological analysis has the tools to address the characteristics of contemporary metropolitan areas.” “The parcel-based GIS can help to move the centre of urban morphological research from its foundation in the study of small historic towns to today's large urbanized regions.” Finally, this concern with the characteristics of contemporary metropolitan areas by Moudon and other North American scholars has distant them from the ISUF and has led them into the creation of MetForg, the Metropolitan Form Research Group.

The Aim of Mapping

The combination of formal and spatial features with accompanying data through GIS allows quantifying some aspects of urban form. It also reveals relations between urban form and prices of land, taxes, composition and density of population and use of different transport modes. These studies have shown how physical features like blocks size, street design, sidewalks, influence the way these spaces are used and can even stimulate or on the contrary, frustrate pedestrian use, something which is a delicate issue within North American suburbia. Therefore, one of the main goals of the authors of these types of studies is to incorporate aspects of urban form that, as shown by their studies have influence in pedestrian use, into the planning of urban areas. They show how urban design approaches focused in the form and design of the street system can stimulate the use of public transport and pedestrian use in suburban neighbourhoods. The hope of Moudon, for example, is that morphological studies of the North American suburbia and in general of recent urban developments with the aid of GIS might generate applications for “the management of future urban development” (Moudon1998).

Generalizations to the study of the contemporary urban landscape

In the first place, studies by Moudon, Southworth and Owens, and Hess have shown that the same ‘Plan Units’ that Conzen identified in his studies can be identified in suburban neighbourhoods and a classification can be developed for the different types of plan units. However there are differences in this form of plan units. Because the size of plots increases, it is the open space that dominates the landscape of suburban developments.

Second, as already mentioned, what this approach has emphasised recently is the possibilities to quantify formal aspects and through this link them to planning. Southworth and Owens (1993), for example, look at different scales: community, neighbourhood, street network, blocks, streets, and intersections, as well as the individual lot and house, comparing typical ground plans of different areas. Their studies try to quantify each of the elements in relation to the different scales, for example, by counting intersections or comparing sizes of blocks or lengths of streets. They demonstrate the relevance of urban form for generating liveable urban areas. Moudon talks of the problem of scale that such large urban extensions in the United States represent and how GIS tools contribute to overcome this problem since they allow zooming in and out while regenerating and updating the amount of information and detail in each specific view (Moudon and Hubner 2000).
Figure 16. From: Boeri, S., E. Marini, et al. (1993). Il territorio che cambia. Ambienti, paesaggi e immagini della regione Millanese

Figure 17. From Viganò, P. (2004). New territories: situations, projects, scenarios for the European city and territory

Figure 18. Oversized perimeter blocks in West Flanders. From: De Meulder, B. (2008)

Figure 19. Mapping to visualize scenarios. Possible ways of development of the system of settlements in the Venice area. From Viganò, P. (2004).
4. 2. The form of the territory: ‘Transformations of the European Habitat’

The Context of the mapmakers

While in America the discourse on sprawl and suburbanisation has been around for long time, the late 80s and 90s saw in Europe the flourishing of a discussion about dispersion in the European territory. Inspired by the text of Indovina (1990) about the ‘città diffusa’, a group of studies started mapping and studying the logic of occupation of that dispersed city. Studies of this type were developed in the Italian, Spanish, French and Flemish context. They have been collected in publications like ‘L’explosió de la ciutat’, published with the occasion of the Barcelona Forum 2004, and in events like the symposium ‘New Territories’18, where also design proposals for these scenario were discussed, and which concluded in a publication in 2004 (Viganò 2004).

The large emphasis in mapping of these type of studies relates to the idea of description (Sola-Morales 1989; Secchi 1993; Janssen 2002). According to these authors, description is necessary in order to understand the specific conditions of the new form of city through the mapping process. This new form of city contains altogether old centres, dispersed areas and agricultural ones in between the previous ones. This interest in description is very much related to that new form of city which is not yet totally known in its formal features and origins. However, the idea of cartography for these authors is not a static one, but it is cartography as a tool for research and intervention (Dehaene, 2002). In this conception of cartography, these studies coincide with the ideas we have already mentioned from landscape urbanism and recent map theory about the map as project, text and process rather than as finished object.

Finally, the geographical context of the mapmakers as well as the studied regions also have a large influence in the development of these types of studies in the form of the territory. Most of these studies concentrate on areas of south Europe and Flanders. These areas have been already characterized by dispersion of settlements and activities due to very particular conditions. In Flanders for example, the planning system, the power of local municipalities and the early development of great network of public transport system have caused a very early dispersion. In Italy, the planning system and the nature of the territory have created the same effect. Recently, the Mediterranean regions have experienced a particular type of urbanization caused by tourism that also spread along coasts of the whole region.

The Aim of Mapping

First, all the studies identified within this line of thinking

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17 ‘Transformations of the European Habitat’ is the title of a study lead by Secchi in 1990
18 See http://brezza.iuav.it/urbanphd/newterritories/ last accessed:12/04/2005
Figure 21. From Palmboom, F. Landscape between The Hague and Rotterdam

Figure 22. From: Frijters, E. and R.P.B (2004). Tussenland

Figure 23. Between the Rhine, the Vecht and the Drecht. From: De Wit, S. (2009)
share an initial motivation to document and describe (but as explained previously a description that reveals something new) the territory today. It is a departure point that the contemporary city is of a new form of combination of existing ones with new ones, namely, open areas, infrastructure and the landscape, and therefore its particular spatiality needs to be documented first. The means for this documentation is cartography.

They observe the contemporary city as composed of multiple layers built along the history of the city. Within this conception, there is not a juice of judgement about whether specific layers (the historical city) are desirable or not. In this order of ideas, the historical city was also constructed by different interventions at different periods that are overlapped today. This can be observed by their reference to the text by Corboz, ‘The territory as palimpsest’ (1997 (1983)) where palimpsest refers to the way the territory is layered but also to our impossibility to completely apprehend it (Dehaene 2002).

Second, these studies are very much involved with an idea of generating scenarios. As Secchi clearly states: “For this reason we have no choice but to limit ourselves to constructing partial scenarios, parts of an overall picture that we cannot even say will be in the forefront or on the edges of the future picture, or whether these will be just a fragment or a detail of the future picture.” For Secchi a scenario is not a prediction and is not a representation of our wishes but a tool.

The subtitle of the book ‘New Territories’ refer us to the thinking in terms of scenarios: ‘situations, projects, scenarios for the European city and territory’. The scenarios are constructed through maps and imagining different possibilities based on actual tendencies identified in the occupation and transformation of the territory. The scenario is not imagined for one city, or one centre, but for a whole territory which is the new form of city. As Viganò notes, in relation to the scenarios she designed for the region of Salento in Italy, “Contrary to current opinion the porous character of the diffused city presents a great opportunity for paving the way for a correct development of biodiversity and expansion of nature, in order to construct landscape and an environments that will interpret the values of contemporary society” (Viganò 2001).

Generalizations to the study of the contemporary urban landscape
Two main affirmations about the contemporary city are important for the aim of this research. First, the idea that sprawl, or dispersion is not a new phenomenon but it is a process that has been going on for a long time in Europe. As stated by Secchi, “much research in Italy, in Flanders and in some other European regions, showed that sprawl is not a new phenomenon, but one that began in Europe during the 16th century with the colonization of the territory by Roman or Venetian villas, or by the castles-villlas in Flanders” (Secchi 2005).

Second, it is that the city is now of a new form, “it is a metropolis which encompasses ancient cities and villages, their modern peripheries, fragments of the legacy of the “great generation”, agricultural, as well as other areas where people and activities spread out in the pursuit of comfort and welfare” (Secchi 2005). As such, this new form calls for description and for thinking scenarios that are rooted in the understanding of its specific logic. Most of the studied regions show that it is possible to identify repetitions across each studied region. These repetitions are most of the times product of individual decisions spread in the territory; “the excessive power of a few principles of order” (Boeri 2003).

Finally, the specific logic of this new form can be understood as overlapping layers. For example, in the study by Boeri, Lanzani, and Marini about the territory of the Milan region (1993), the authors identify various systems with specific types of organising logic, densities, and characters. The compact nuclei constitute only one of the systems, complemented by the others. The different systems are not separate, but overlap, and together compose the greater Milan region. Similarly, De Meulder and Dehane (2002) find overlapping layers in their study of the South-West Flanders, each of them with the logic of a different system.

4.3. The form of the Dutch landscape

The Context of the mapmakers
A group of studies that use mapping to study the form of the landscape is conducted in the Dutch context. They argue that “The form of the landscape is not accidental or random phenomenon” (Wit 2009). These studies deal with the landscape, because the built environment in the Dutch case includes the rural areas which are transformed artificially just as urban areas are. The landscape is object of study because the landscape itself is a construction. The structure of the water system defines units of intervention and of transformation of the territory and constitutes already an underlying grid structuring the territory. The attention to the rural landscape can also be explained because the Dutch system of cities is not mononuclear, but a structure of interconnected small nuclei. The landscape between these urban nuclei is observed as the counterpart of the system of cities and an integral component of the total system.

About the study of the Dutch landscape at the TU Delft, Palmboom explained in a conversation19 that the 70s saw a return to studying the Dutch landscape as a reaction to the modernist interventions that ignored and in some cases destroyed it. Around this time, several articles published in the Wonen TA-BK analyzed the traditional

19 F. Palmboom was graduating at that time from the faculty of Architecture at the TU Delft having studied with A van Eljik and M Risselada. He is author of ‘Rotterdam, verstedelijk landschap’ (Rotterdam, urbanized landscape) (1987), among other works. Date conversation: 05-12-2003.
Figure 24. From: Corner, J. M. and A. S. MacLean (1996). Taking measures: across the American landscape. Title: The survey Landscape. 14x20".

Figure 25. Dispersal Graph Dallas/Forth Worth, Texas. "Population density declines sharply within a ten-mile radius from the city center in all four quads measured. Growth outward from the city center is mostly continuous with few zones of very low density (black) between urbanized areas." (Berger, 2006)
Dutch landscape. Most of these studies came from the faculty of Landscape Architecture at the University of Wageningen, with people like Hubert de Boer and Wouter Reh who both later went to Delft. They started looking at the Dutch landscape from the point of view of layers (soil, parcels, constructions, architecture, etc.). These different layers become visible by the process of mapping them and isolating them from each other. In this way, very clear and rational systems emerge as underlying the Dutch territory.

The Aim of Mapping
The studies of the landscape anticipate the process of expansion of cities by observing the landscape as a complement to the system of built areas. The landscape is perceived as the underlying layer of urban structures, existing and planned ones. For example, in his study of Rotterdam, F. Palmboom (1987) shows that the fragmented structure of the city of Rotterdam is the product of two different layers combined: the structure of the ground (or the landscape) together with the water and what he calls the ‘traffic machine’. The analysis through the dissection of different layers allows for understanding the different structures that combine in an urban area and that sometimes collide. The same can be observed in the study of Amsterdam by M. de Hoog (2005) where he identifies four different urban environments (‘stedelijke milieus’), the grid city on the peat, the water city on the IJ, the polder cities on the reclaimed land and the inhabited parks around ribbons of villages. What is important in these observations is the plea from both authors for a different type of intervention for the different areas which should lead to a different morphology and structure of the area, in many cases explained by its different ground structure.

The way the landscape is a grid over which developments occur is observed in the studies by Reh and Steenbergen where drawing is a tool to express the characteristics and structure of the landscape. The geometry of the landscape is revealed through the process of drawing, which shows not only an abstract geometry but also a relation to the technological functioning of the water structure in the polder landscape. The landscape is perceived as an architectonic construction. The study of this landscape is, as in the Palmboom’s description of Rotterdam, also split into layers: the natural landscape, the cultural and the urban. The relation and interaction between these three layers allows one to speak about the morphological and typological characteristics of the landscape (Reh, Steenbergen et al. 2005). The studies in the polder landscape have an objective that connects very well with the original objectives of the typo-morphological studies, the understanding and dissemination of the structure of the typical Dutch polder landscape, to develop mechanisms to protect it. In the same way, to develop intervention taking into account the logic of this polder landscape, origin of its esthetical value.

It is notable that geometry does not only play an important role in the artificial landscape of the Netherlands, in analysis of the English and French gardens, a very clear geometrical structure comes into the light. This structure is related again to features of the natural landscape and the topography but also to the ideals and concepts put in the design of that specific landscape. The studies on English gardens by Reh (1996) show in a graphical way the relation between topography, morphology and the man made landscape, linked to the architecture and its relation to the landscape. By mapping for example visual axes, and relations supported by visual connections and topography, we can see how the concept behind the design of the landscape emerges with clarity in what is realized through drawing. Drawing brings to the surface the interaction between the natural morphology of the place and the transformation of man and within this, the idea behind that transformation. Summarizing, what these types of studies are observing is the relation between the natural landscape and the architecture, and the way they both interact while the landscape is nowadays manufactured or altered by architecture. This is achieved through drawing, observed as a tool for design research. As Steenbergen and Aerts argue, “the drawing is a means of exploration and reflexive communication” and in relation to design “the drawing can fulfil a role as a vehicle for the imagination and as a means to arrive at a design” (Steenbergen and Aerts 2003).

Generalizations to the study of the contemporary urban landscape
If we aim to understand the form of an urban extension beyond the limits of the traditional city, as is the case in this research, seeing the landscape as a linking element among areas of different densities and types of occupation, and dissecting it in several layers can be helpful tools for examining all the diversity of urban occupations and their organising logic. The structure of the ground is an underlying layer that can help mapping both built and open areas. Furthermore, it can help overcome the radical division of built versus open, or compact versus disperse for an understanding of a continuous entity of diverse landscapes. These studies offer the possibility to take a look under the different types of occupations and densities in the contemporary urban landscape with a unifying gaze given by the structure of the landscape.

4. 4. American Landscape

Context of the mapmakers
Finally, a very interesting set of studies dealing with the contemporary North American Landscape again show that mapping is used for research of the specific character of the contemporary landscape. These studies come from the same approach described in subchapter 2.4.7 in relation to the contemporary urban landscape. They are developed by landscape architects that map, work together with aerial photographers and propose transformations
This table summarizes specific aspects of the recent studies of urban form. It is organized with the same main themes of the review, context and techniques. The last row deals with the main question posed to all the reviewed studies, the possibilities of application in the contemporary city.

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<td>Study of the landscape at the regional scale, identification of principles and processes behind the transformation of the landscape. Observation of geological aspects and the structure of the soil. The geology and structure of the soil gives particular characteristics to the landscape.</td>
<td>The landscape structure gives specific units related to the structure of the ground. For example in the Dutch landscape, the units are constructed with units given by the water structure. While they look at the smaller unit forming the landscape, the large scale of a region is also studied in the way it is constructed by that small unit. In the Dutch case, different structures at different scales are defined by the water management.</td>
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**Table 3. Comparative table of recent approaches to urban form:**

This table summarizes specific aspects of the recent studies of urban form. It is organized with the same main themes of the review, context and techniques. The last row deals with the main question posed to all the reviewed studies, the possibilities of application in the contemporary city.
for typical contemporary sites in the North American landscape, for example 'waste landscapes'. Due to the disciplinary origin of the contemporary urban landscape approach, coming from landscape architecture, the sites of the contemporary urban landscape are investigated as complex surfaces where natural logics, geology and human intervention interact and are understood through mapping.

The studies in the American landscape by Corner, Berger and others attempt to uncover specific characteristics of the North American landscape trough maps that combine topographic features with data, time and photography. They “combine geospatial data, US census empirical findings, and spatial imagery” (Berger 2006). This is enriched with the aid of aerial-photographs where the authors themselves take an active role in the taking of the aerial photo. Consequently, the aerial photograph becomes a survey technique and a research tool. The beautiful documentation of the mining activities and the changes it made in the landscape in the United States in ‘Reclaiming the American West’ (Berger 2002) is an example of how to combine territorial information in maps with data. What makes these studies so relevant, besides their innovative use of mapping and aerial photographs, is the sites which are the objects of that mapping activity. These are typical of the contemporary American Landscapes, like old industrial areas, waste landscape, and leftover spaces.

The Aim of Mapping
Mapping offers in these studies the possibility to revel hidden relations and potentials. “The map-drawings play on certain planning abstractions such as making visible strategic organizations of elements across a ground plane or revealing certain scale and interrelational structures (from regional to local networks, for example)” (Corner and MacLean 1996). “Representational techniques provide the clue that enables the reader to cross-reference and derive new associations among disparate facets of urbanization over time. They add a time direction” (Berger 2006).

Corner and Berger who have developed these types of mappings are both in the Academy while at the same time active landscape architects in North America. Their studies and ways of looking also have an aim. Besides that their publications do not explicitly include proposals or scenarios, the collage maps included inspire already a multiplicity of possible futures. As they say, ‘the map is already a project in the making’ (Corner 1993). Furthermore, in their practices they have proposed transformation strategies for types of areas like the ones they document.

Berger urges in the preface the ‘Reclaiming the American West’: “to me, this is the most interesting aspect of the research on altered sites, because its translation will forge new models of landscape practice” (Berger 2002).

Generalizations to the study of the contemporary urban landscape
As the previously used quote by Waldheim about Landscape Urbanism shows, it is the open space which becomes the structuring element today. These studies align with a more theoretical position about landscape urbanism as a new way to approach operatively the contemporary city which the four disciplines of landscape architecture, urban design planning and architecture cannot cope with. The new conditions of the ‘horizontal city’ call for different approaches. “This condition begs for landscape architects and other designers of the urban realm to shift a good amount of attention away from small-scale site design in order to consider how we can improve regional landscape deficiencies of the urban realm”. (Berger 2006).

20 “meaning actual waste (such as municipal solid waste, sewage, scrap metal, etc.), wasted places (such as abandoned and/or contaminated sites), or wasteful places (such as oversized parking lots or duplicate big-box retail venues).” Berger, A. (2006). Drosscape. The landscape urbanism reader. C. Waldheim. New York, Princeton Architectural Press: 295 blz.
Chapter 5.

Context of the map: other contemporary maps

This chapter complements the review of the previous chapter about the mappings on the form of the territory and the landscape. As explained in the methodology, in order to understand the context of a map it is necessary to study other maps produced at the same time or in similar contexts to it. This is what this chapter does. It compiles and analyses a large amount of maps which are produced recently and are contemporary to those about the form of the territory and the landscape.

As it has already been mentioned in chapter 2, the term mapping has recently become very popular within urban design practices and principally within analyses of urban sites. The introductory line of ‘de Architect’ of December 2002 ‘cartography again topical’ refers to this. The mapping of the territory and the landscape, the theme of previous chapter, is only one of the themes. This chapter gives an overview of ‘other themes’ that are currently topical in the mapping of the contemporary city.

Five new themes are identified in recent mappings: new atlases, mapping perception, mapping flows, mapping time and mapping data. Most of the analyzed mappings were extracted from designs or analyses of specific areas. In that sense, the challenge of this chapter is to extract general observations from specific analyses and designs, and attempt to classify them.
This map, showing countries according to their ranking, illustrates the impact of catastrophic temperature rises. Countries such as Ecuador, Bermuda, and nearly three times as great as others are highlighted in the map. The US, as a major producer of greenhouse gases, shows a significant carbon emission increase of up to 4C by the end of the century. The map also emphasizes the importance of addressing climate change, with top emitters like China, the US, and Russia highlighted. The map further draws attention to the role of South Korea, Japan, and the Netherlands in addressing climate change through their significant carbon emissions. The map concludes with a focus on the growing importance of tackling climate change, evidenced by the increasing numbers of countries and regions committing to reducing their carbon footprints.
5. 1. New atlases

This first section does not refer to one specific theme but to a collection of them. It refers to the recent proliferation of atlases among publications on architecture and urbanism. The main idea behind this large production of atlases lies in the attempt to consolidate regions that often do not have an administrative or political status. This responds to the emergence of new scales where cities create conurbations or where regions do not necessarily correspond with defined political or administrative borders; where political divisions, natural barriers, or concepts of borders and limits are redefined. Moreover, this has to do with the fact that the smallest unit to compete and position itself in the global world is a region and that all regions need to compare themselves to others and in this way understand their actual position.

At the same time, these new atlases are looking for something special which their mapped region can offer. As Asher (1995) shows, two processes go parallel in the metapolis, homogenization but also differentiation; regions need to differentiate themselves from others in order to show a special character that allows them to compete. What can highlight a specific region or position it on the map? the local, the specific, the different, these are themes for a possible branding. This branding can search for example into historical references. In many of the reviewed studies: Euroscapes (Broesi 2003), USE (Boeri 2003), the KAN Atlas (Boelens and Sanders 2003), there is a repetition of maps of the different empires and borders of Europe that have existed along history: the Roman, Ottoman, empires, etc. Through this mapping of a region in different periods, they are trying to define what the region is today.

The first idea is that through mapping and specially by making an atlas of a region, this region is highlighted. In some cases, this means compiling and homogenizing information that was previously presented in different ways per municipality or per city. The second idea is the attempt to trademark regions; by mapping, discovering what is special and in this way, what can be sold as a brand to the rest of the world to attract visitors, investors, etc... The mapping generates a sort of logo or visual image that can easily identify a region. For example, the case of the KAN atlas (Boelens and Sanders 2003), a map showing the ghosts and witches, or one showing the possibilities for walking tours, bike tours, natural areas, is able to show particularities that in comparison with other areas of the Netherlands can increase the attractiveness of this region. The fact that the KAN maps usually start by showing the mapped subject in a bigger context, such as North Western Europe or the world, allows them to position the region in relation to similar ones that share its peculiarities.

The same occurs in HICAT, Hyperterritories of Cataluña (Gausa, IAAC et al. 2003), where we see again that the authors have to define what Cataluña is, and how it can act in a global world as one region. For this reason, they develop a publication containing cartographic information about relations and comparisons to other areas and regions, as well as information on what is specific or what it has to offer to the rest of the world. Through mapping, it consolidates itself as a region, as a new unit or totality. In the comparison, which is also carried out through mapping, it positions itself against other similar regions. This is done with the purpose to pulling itself up in the ranking in relation to similar regions, and highlighting the potentials and specificities that can be offered to the rest of the world, allowing it to compete.

It is ironic that many of the atlases recently published do not really offer explanations of the reasons why that specific publication is an atlas nor any insight into the working method, techniques or criteria for selection of the maps. It seems that similar to ‘mapping’, the word ‘atlas’ has become very fashionable. Many times they are more than compilations of maps as in a traditional atlas. For example, the ‘Atlas of change’ in the Netherlands even if it has some maps by Must, is mostly composed of interviews and photographic reportages. Other examples, like the KAN atlas, offer in the introduction arguments for the fact that the document is an atlas. The authors explain how a set of maps is needed to give insight in the characteristics of the KAN region (Boelens and Sanders 2003). They also acknowledge, from the beginning, the limitations in making that atlas and state their working method and selection criteria, trying to be in line with the cartographer’s approach.

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20 Atlas: a bound collection of maps often including illustrations, informative matters or textual matter (Merriam Webster).

21 Metapolis is a term elaborated by Ascher (1995) to refer to the next phase after the metropolis. See 2.4.3.
5.2. Mapping perception:

In the context of the map for the traditional morphological analysis (5.3) the theme of perception emerged at the same time as the theme of morphology in the 60s. In that case, the studies of Lynch and Appleyard give arguments for this position. Within the recent maps, perception emerges also as an important theme. Lynch and Appleyard discuss experience, perception or the image of the city in terms of the influence which physical aspects have on that perception or image. Recently, we see an increasing attention to mental mapping and attempts to involve other aspects of the urban experience. Maps that show the specific structure of a person’s urban environment or of a person’s space of experience have become very common. In this type of observation we see that the physical aspects of the city are more relative since they have different values and meanings for different people. These maps deal with the idea that everyone constructs its own city from the fragments he/she chooses.

For example, as part of their Mapping of a changing Netherlands, Must (2000) includes a series of maps which they title ‘New users’. These maps represent the experiential space of three persons. Since that space is not located in one city but includes places they travel to work, go for holidays but also where they do their everyday shopping, the maps overlap different scales in order to connect these spaces. The interesting aspect of these maps is that all these spaces do not correspond like they used to do with one location; working places for an individual who can be everywhere in the world, or in the Netherlands. They become then unique maps of the everyday space of that selected user; ‘formed not only on the basis of an objective topographic image but along the lines of entirely personal mental constructions’ (Must 2000).

Must, for the publication ‘Nederland Netwerkenland’ (Boelens 2000) also maps four autobiographic everyday events. In this example, again different places in different parts of Amsterdam, the Netherlands, Europe and the world are all connected by networks and interact in producing an event. The maps then show these places and their relations and interaction for that specific everyday event. A new geography emerges where areas very distant become part of someone’s everyday space and the maps reveal this. These examples are mapping more than perception of a specific space, as Lynch did, but the everyday space of someone, which is not anymore geographically confined to one location.


Figure 27. ‘The fantastic structure of events: The trip (de reis)” From: Must (2000). De fantastische structuren van gebeurtenissen.
While the physical space of the city might appear as something static, or changing at a slower pace than other aspects like functions and uses of that space, movement occurs within that space. Objects, persons and information move within urban space. The mapping of movement or the mapping of flows in relation to urban space is another theme that has acquired importance recently.

One of the early examples of mapping of flows are the drawings by L. Kahn of the traffic flow in Philadelphia for his plan of midtown (Kahn 1953). In the text, Kahn uses the analogy of rivers and canals for the streets explaining the idea of flow and movement in the city; this flow, and its varied intensities is what his schemes show. In the maps, the important consideration is not the built component of the city but the space of the streets and what moves through it. The flow that is represented has different directions and hierarchies. This map by Khan shows how very simple use of arrows can give a very clear picture of the movement flows for an area. The visualization of this movement allows us to observe the interaction with the urban space and in this case with the architecture. What is very remarkable in these drawings is the fact that a simple two-dimensional representation of lines is able to express all the complexity of the flows of Philadelphia and then with the same convention, to allow mapping a proposal for transformation.

Another way to map flows can be exemplified with the maps of the Architecture Biennale of Rotterdam 2003 (Houben and Calabrese 2003). In this case, the flow itself is not mapped, as it is in L. Kahn’ schemes, but the infrastructure where that flow occurs and the experience when moving through it. The infrastructure is not just mapped from the topographical map but its representation is manipulated. It is straightened, it is made into a line, or in the case of the Randstad a circle. A continuous line relates closely to the experience and speed of movement from within the infrastructure network. This straightening of the line was also done in ‘The view from the road’: “the roughly triangular route has been straightened out by breaking it at the corner of intersections, so that it can be read as a continuous linear sequence” (Appleyard, Myer et al. 1964). Along the line, different signs and arrows represent visual aspects and experiences from the road. In the maps of the Randstad from the Biennale, the different visual perceptions from that line are mapped and a legend is developed for it. Maps show for example different uses encountered when moving along that line. Moreover, the experience from a person moving in an auto along the line is mapped. They show what that person sees or does not see, when his/her view is closed or when it is open, whether there is any visual relation to the context or the specific urban area he/she is crossing. The legend of the map refers to different landscapes, landmarks and degrees of closeness or openness of the visual field. This line of infrastructure becomes the reference from which the map is drawn and understood.

In addition, GIS (Geographical Information Systems) allows connecting data and information to lines or other features of the topographical map; for example, when drawing maps of the intensity of flows between two points. The data that quantify the amount of users of a specific infrastructure line can be added to segments of that line and this can be represented by different thickness at different locations. These types of maps can show, for example, the amount of commuters between two cities or the amount of flows towards a centre. In this case, the flow itself is not mapped, as in the case of Kahn’s drawings for Philadelphia, but the amount of movement or of objects moving on the different segments of the network. The intensity of use of the network and of the flows through the different segments of the network is what is mapped.

While the examples in the previous paragraph show the mapping of flows by mapping the intensity of the flow, tracking technologies allow mapping and localizing that flow. These technologies like Global Positioning Systems, mobile phone tracking, video and RFID monitoring allow studying human activities patterns in space and time (Schaick and Spek 2008). In relation to mapping flows, tracking technologies allow mapping of the movement paths of people through urban areas. The recording of the traces of persons and its posterior mapping can shed light on how people use a determinate urban space, main routes pedestrians follow through a city or spaces which are used frequently coinciding in various paths. This information can constitute a great input for redesigning city areas but still limitations in the use of the technologies and the information they deliver have to be researched and overcome.

Finally, it is important to mention the mapping of the internet flows. Many projects and scholars are busy trying to create maps of the net, maps of virtual communities, and maps of virtual conversations. The internet is a new space that calls for maps that explain the navigation. For example, in the case of virtual conversations, users feel the need to observe a map in order to understand their position within the community and the conversation (Abrams and Hall 2006). These are less relevant in this research since they do not deal with the topographical map or with physical space. These networks are virtual and although of great importance and influence in the contemporary urban experience, transforming our experience and use of physical space, they will not be looked at here in more detail.
Figure 28. Mobility-centralities, from Panerai, P. (2008) Paris métropole : Formes et échelles du grand-Paris

Figure 29. Randstad Avenue, from Houben, F. and L. M. Calabrese (2003) Mobility a room with a view
Figure 30. Louis Kahn. Plan for Midtown Philadelphia, 1956

Figure 31. Density of road traffic, from Boelens, L. and W. Sanders (2003) De grote KAN atlas: mentale atlas van het stedelijk netwerk Arnhem-Nijmegen

Figure 32. Spatial patterns from home-work streams in the Randstad. From: Hall, P. and K. Pain (2006) The polycentric metropolis learning from mega-city regions in Europe
Figure 33. Distortion of topographical map by distances measured on time.

Figure 34. Activities according to time, from Oswald, F., P. Baccini, et al. (2003). Netzstadt: designing the urban.

Figure 35. Example of maos with Isochrones, multimodal accessibility Cambridgeshire (left), multimodal accessibility London 25 km (right). From: ‘Travel time maps’ of Great Britain. www.mysociety.org.
5.4. Mapping time

When looking at mapping time, we could be initially referring to transformation of a space or area through time. We refer then to historical reconstructions through sequences of maps to show the changes that a specific urban form or determinate urban space has gone through. This way of mapping time is used in morphological studies. It refers to transformation in long time periods since these maps are normally done for periods separated by years or decades. However, when thinking about time in a more dynamic way, in shorter time intervals, there are other types of attempts dealing with mapping time in different ways.

It is very common nowadays to encounter illustrations of geographical distance distorted by time distance in recent reports or publications about urban regions. These are illustrations of the type: ‘here is my city or my region’ and ‘we are so close (in time, not necessarily in distance) to other important places’. These maps show where a specific urban region is located in terms of time. With the development of transport and communication technologies, distance has become relative and recently it is not measured anymore in terms of kilometres but in terms of time units. F. Ascher points out that in the périphérique of Paris the distances between exits are not stated in kilometres but in minutes; in the same way, Fishmann (1990) notes that in suburbia one talks about distances in minutes, like the amount of minutes you are away from the mall.

In relation to mapping distance in terms of time intervals, first there are the topographical maps where isochrones\textsuperscript{22} are drawn from a specific location towards the surroundings at different time intervals. These are maps that show lines and curves limiting the different areas accessed by different time distances from one or more points. One example is the ‘Travel time maps’\textsuperscript{23} of Great Britain where several examples show accessibility with the use of contour lines and colour codes. They show, for example, accessibility of the train stations in Britain from the Cambridge station or on a more detailed scale, the accessibility in London by public transport to a central place in the map. A more elaborated way to map time which does not use isochrones, is using those lines to distort the map in order to show how geographical distances change with different degrees of accessibility to places. These types of maps are called ‘anamorphosis maps’. Denain & Langlois (1998) define anamorphosis as a cartographical process that consists of changing a variable descriptive of space by one deforming that space\textsuperscript{24}.

Finally, another way to map time consists of mapping the different activities or uses that occur in a space at different moments of the day, week, year etc. However, examples of this type are found more in relation to architecture or specific spaces or buildings. In this case, what is attempted to be mapped is not a change in the physical space, but the way it is used differently at different moments, for example during the day and at night, or in spring and winter, etc. In this way we see how the space is transformed by the influence of time, by different uses of it.

\textsuperscript{22} Isochrone: an imaginary line or a line on a chart connecting points at which an event occurs simultaneously or which represents the same time or time difference (Source: Merriam Webster online, retrieved 3-04-2007)


\textsuperscript{24} One example of Anamorphosis map is the ‘New Spatio-temporal map of Rotterdam’, project by Scape (urban design office in Rotterdam) in collaboration with V2 (Institute for the Unstable Media) for the Rotterdam municipality. In these maps, the topographical map of Rotterdam is distorted by the different time accessibility of the different transport modes. See image tour.
Figure 37. From: Maas, W. and MVRDV (2000). Costa Iberica

Figure 38. From: ETH Studio Basel et al. (2006) Switzerland: an urban portrait

Figure 39. From: ETH Studio Basel et al. (2006) Switzerland: an urban portrait
5.5 Mapping data

The examples shown in mapping-flows, like the map of commuters, where information about the intensity of flows is assigned to lines or segments of lines, and those shown in mapping time, where isochrones are drawn over the topographical map to show the accessibility in specific time segments of areas, are all examples of quantitative information combined with the topographical map. Most of these types of maps are developed with the aid of Geographic information Systems GIS.

While the mapping of urban form has to do with material and spatial aspects that can be read or extracted most often from the topographical map, mapping data involves the addition to maps of information that is initially not expressed in spatial terms, or does not originate from the topographical map. This allows for comparisons where physical aspects can give explanations to data or vice-versa, a location that can be explained by quantitative information. It implies a quantification of certain aspects that can become spatial through the mapping. Ranges or intervals of specific types of data define a legend where colour codes can be added to the map, assigned to areas, lines or points.

Recently, there is a term being used by architects and urban designers which can be used in connection with mapping data: 'Datascapes'. The term, generated in relation to MVRDV's work, is defined by Bart Lootsma (2003) as ‘visual representations of all the quantifiable forces that can influence or even define and control the architect’s work.’ Lootsma explains that although it originated from within architecture projects, it expanded to “offer a way to understand the development of the environment in a more general way.” This way of understanding goes even further, becoming a bridge between reality and the project. “The way MVRDV uses data, it works as a kind of intermediate language between other languages: a language that enables us to translate one language into other or at least creates an intermediate platform between them.” (Lootsma 2003) In this case the data are not only mapped, they are not only translated into design, but it is also the intermediate stage and playing with the data in the form of maps that allows it. After the term appeared in relation to MVRDV’s work, it is now broadly used and it compiles in a way the current approach and a common attitude towards architecture and urban design where the maximum amount of variables and information is brought into the generation of a design project.

The themes we see as recurrent in recent maps give an indication of the topics on the agenda of urban studies. In that sense, we encounter through this review, how important the thinking in terms of processes and time has become. In general, what the review shows in relation to the themes mapped is the paradigm shift toward a paradigm of complexity, emergence and subjectivity. In this specific case, it could be described as the change from a formal paradigm to one based on processes. Here, space is approached as something changing with experience, time and therefore the form becomes at some points relative, depending on the users or the use made of it. The themes that will be dealt with in the coming pages are in general about relativize distances influenced by other factors that become more relevant and consequently the distortion of the topographical distances and the topographical map.
Mapping to visualize choices in design process. From Edzo Bindels, Ruurd Gietema, Henk Hartzema, Arjan Klok (2000)


5.6. Other maps, new themes and new scales

The different themes presented in the previous pages show an attempt to map questions of time, data and perception. They could all be related to mapping of issues that alter the experience of urban space, or themes that give more importance to other issues rather than the form of the contemporary city. In relation to this, the issue ‘Archis is Atlas’ (2004) argues for the section of maps included because today questions about where one is and which direction one is going, which used to be the important in relation to cartography, are no longer the most relevant. The new questions are more of the sort, when something happens and under which conditions. In this sense, Bouman argues that the topographic map is no longer very useful since it is not so important to find your way anymore. Three dimensional maps, schemes, and diagrams which within their complexity can represent and show many different issues of the contemporary world, might help understanding it better (Bouman 2004). Similarly, the maps included in ‘Elsewhere/mapping’ include a much larger spectrum of maps than only maps dealing with topographical issues. As the authors state, “The mapped ‘space’ under consideration here ranges from information space (grasping patterns within vast quantities of data) to physical space (navigating the city, region or globe) to social space (representing power relations within and between organizations, whether corporate cultural, political or even covert)” (Abrams and Hall 2006).

Figure 43. Different scenarions for distribution of population in the Netherlands. From: Nederland Nu Als Ontwerp (1987)
Chapter 6. Conclusions for case studies

This chapter derives general conclusions from the reviews developed in the previous three chapters. The reviews which were divided into traditional and recent approaches, show two different contexts and attitudes towards the form of the contemporary city. These are even more obvious when the context of the map for the recent maps in other subjects than urban form is studied. The main observations of the review of the vocabulary in chapter two are two main positions which appear in relation to the contemporary city and issues of form within it. These two positions are clear again in the review of mappings. The Nolli map serves to exemplify these two attitudes.

Later, a set of techniques that emerge from the study of different maps is included. Afterwards, the types of techniques that can be useful to map the form of the contemporary city in the case studies are stated. These have relation to the identified themes that characterize, according to the current studies which have been reviewed here, the form of the contemporary city. They also relate to the different contexts and questions of the moment.

Finally, specific conclusions about mapped themes and techniques are derived for the case studies, a mapping of two regions today, and for the general conclusions of the research.
6.1. Summary of the context: two attitudes with an intermezzo

The review of different studies in the previous chapters and the context in which the studies are developed can be summarized by defining two attitudes towards the existent city today and at the moment of development of these studies. In the period from the 1960s when the traditional morphological analysis started to develop until today, the period from which the selected maps are taken, there has been a very important transformation of ideas in architecture and urbanism, which influenced the context wherein the mappings are produced. Between the two attitudes we identify an intermediate one that we call intermezzo, during a paradigm change where elements from the first attitude are present together with a new attitude that emerges. These two attitudes have two different responses in the mappings themes. In the first one, the post-war period of massive application of the principles of modern urbanism has as response a cartographical reconstruction of buildings and urban spaces of historical centres. In the second, we find subjects like mapping time rather than space, mapping change of space by time and by networks relation of proximity, mapping city of each user acquire more relevance than the physical form.

The first comes from the context of the studies in traditional urban morphology. We call it ‘the city as architecture’. The intermezzo is behind the context of the other maps which were contemporary to those in traditional urban morphology, where other aspects as perception and flows become important in maps. The last one is the current context of mapping in which the mappings of the territory and the landscape are flourishing, but also many other different types of maps and atlases are being developed, where the variety of themes which are being attempted reflect the complexity of the contemporary urban reality. We call this one ‘city as process.’ The timetable included at the end of this chapter shows, with different colour codes, the different periods and the different publications and studies from which the examples were extracted in relation to them. This table also shows the different mapped themes and techniques in relation to the different contexts.

City as architecture
This period corresponds with what N. Ellin (1996) calls the Romantic resurgence. It is of course a period with many different tendencies and this classification is a reduction. However, this reduction tries to highlight a general attitude. This general attitude frames the approaches towards urban form which were explained in chapter three. Here the main concern is the post-war reconstruction of cities with a large deficit of housing and the massive application of the principles of modernism in that reconstruction and in the solution of the housing deficit.

The reconstruction moment is framed by a discourse about a healthy environment and social equality with space as the mediator to achieve it. In that context, historical centres are threatened since they are seen as unhealthy environments. This context generates a reaction that calls the attention back towards the city as architecture and the re-discovering of the historical centres. Because of this, the emphasis is on the detailed mapping of areas of historical centres. A clear example of this is the study of Bologna (Cervelatti and Scannavini 1973) which became the basis for an approach towards the restoration of the historical centre of the city.

In this period, the aim of mapping is initially one of documenting, with a high level of detail, the formal and spatial characteristics of a specific area, mostly within historical centres. However, this documentation activity has the specific aim behind it of generating design guidelines on how to operate within those historical settings. These guidelines are not just of any type, they are already directed towards conservation, and if not possible, towards interpretation of the characteristics of a specific area leading to interventions which ‘respect’ those characteristics.

Intermezzo: transition and paradigm change
The context of other maps which were contemporary to those of the traditional morphological approach indicate a paradigm change from the study of urban form to the study of urban processes. This period frames a context different from the one of the city as architecture from the previous period, but not radically different. To start with, the frame for this observation of the everyday, the vulgar, banal and commercial can be found within the context of Pop Art, especially in North America at that moment. However, ideas of the perception of space, as developed by Lynch and others, have a lot to do with the form of the space, while simultaneously show incorporation of new subjects like perception, urban experience and speed and flow in relation to the highway. The same applies for the idea of studying the banal discussed by Venturi and Scott Brown. However, in these studies, signs appear about changes of direction and interest within the approximation to the city from arch and urban design.

The aim of these studies is also related to the previous periods in the sense that here, also characteristics of the existing built environment generate a vocabulary for new proposals. In this case this vocabulary emerges from the banal, the commercial and the everyday as can be found in Venturi and Scott Brown’s projects.

City as process: space-time and relations
Recently, the maps produced correspond to a period framed by the paradigm of complexity, reflecting uncertainty, process and relations. Within this frame, the maps developed attempt to cope with that complexity and the multiple relations to which anything is subject. Mappings dealing with the compression of space and time facilitated by the network society illustrate the way topographic space is distorted. Maps of perception and
mental maps show that new urban space, personal for each inhabitant, emerged from the interaction in the network city which is not anymore spatially bounded. At the same time, we are in a moment of global order, global competition and global risks while virtual communication, virtual communities are as important as real experience. This complex panorama explodes in a large production of maps and atlases of all types. Maps then try to give account of multi-scales involved in projects, and also multi-actors and multi-relations. They try to spatialize all those invisible forces in play in an urban space and in an urban project. It is a period of explosion of mapping, but at the same time it is a period that emphasis on being projective.

The studies in the form of the territory and the landscape are also framed within this period. Their difference from those of the urban morphology tradition is the position about the relative autonomy of urban form from other processes. While the traditional schools of urban morphology argue about that relative autonomy of urban form, the authors of the form of the territory and the landscape argue that their observations should be complemented with others in social, political and economical aspects of their study objects. In that sense, these studies emerge after the multidisciplinary and complex understanding of the city as product of many process and actors involved.

Finally, this context clearly shows the use of mapping to visualize different scenarios. This can be observed in studies of urban form but also in maps using data where the data is also distributed in different scenarios in space. The setting up of a future or many future scenarios for an urban area necessarily requires mapping to facilitate comparison. Mapping scenarios becomes an instrument of comparison, discussion and consensus. Another clear aim of the maps produced in this period, influenced by global regional competitiveness, is the use of mapping to consolidate regions. Atlases and specialized studies about regions, highly documented through maps, are one of the tools for this regional competition. In relation to design projects, the maps produced in this period can be used to produce almost caricatures or abstractions which try to compile the essential characteristics of an area (a sort of logo) or a strong feature that can be used as a theme in a design proposal.

The Nolli map (1748) as an example of the context of the mapmaker in the three periods

The Nolli map of Rome and its several uses through history help us understand the relation between a specific map and the context of the mapmakers. In this case, they show specific ideologies and attitudes towards the city, exemplifying the three periods described in the previous paragraphs.

The ‘Grand plan of Rome’ was prepared by Nolli between 1736 and 1748. Apart from the accuracy and detail with which Nolli accomplished with his map, the way he used the same convention to map open public space and the interiors of churches, passages, courtyards and public buildings, make it a compulsory reference for architects and urban designers. It was drawn from a section at the ground level, showing the relation between open space and interior public space, showing the experience of the city of someone walking through it.

What makes the technique so relevant is the fact that monuments and special buildings are situated in their context “countering a tendency in contemporary architectural history and criticism to examine objects as isolated monuments outside the very context that give them life and meaning” (Tice, J. 2005). The representative value of the building is given by its public function while it also responds to the poché25 and open spaces. As Graves (1979) explains, “the relationships of piazza, threshold to internal public room with a sense of marché or promenade, that would be unimaginable using other graphic assumptions.” Or as Meyer points out, “it is used to denote space that in daily use serves as public space, part of the domain in which the daily public life of the city takes place. In those days, a church was not only the centre of religious rituals but was a locus of the everyday life of the city” (Meyer 2002).

As an example of works produced in the first period, with its concept of city as architecture, the Nolli map was used by Rowe and Koetter (1978) in Collage city26 to derive the figure-ground representation and with it to articulate two different spatial configurations, the building as texture and the building as object. This work is mostly quoted because of its criticism of Utopian modernism, the plea to rethink the “importance of the street, the axis and the role of building mass as a definer of urban space” (Ellin, 1999), and in relation to the visualization techniques, for illustrating this criticism and explaining the difference between the building as texture and as object. This technique is the figure ground representation, where the authors refer to Nolli as prototype (Ellin, 1999). Using this technique to compare the Uffizi’s in Florence and the Unite d’habitation in Marseille, “the comparison of a void and a solid of almost identical proportions”, Rowe and Koetter (1978) explore the difference between the traditional city (of a continuous building mass with a network of public space cut out) and the city of the Modern Movement (with free standing objects in flowing space).

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25 Poché: “In architectural drawing, the blackened portions representing solids.” (Harris, C ed. 1975) Used by Venturi in complexity and Contradiction and afterwards by Rowe and Koetter in Collage city (1978): “It seems that the general usefulness of poché in a revived and overhauled sense, comes by its ability, as a solid, to engage or be engaged by adjacent voids, to act as both figure and ground as necessity or circumstance might require; but with the city of modern architecture, of course, no such reciprocity is either possible or intended.” (p.79)

Figure 44. Fragment of the Nolli map (1748).

Figure 45. Roma Interrotta, design from Colin Rowe for Sector VII. From: Graves, M. (1979).

Figure 46. Proposal from Perez de Arce for the capitol area of Chandigarh to introduce back the Poché, using the Nolli map as reference to show how with only isolated buildings of monuments character is impossible to have urban order. (Perez de Arce, 1978).

Figure 47. Nolli map of the Strip of Las Vegas. From: Venturi, Scott Brown et al (1977).
Another example of a work from this first period is the idea of the Roma Interrotta manifestation (1978), which used Nolli’s map as its starting point and not the map of Rome at that moment. This exemplifies an attitude towards the history of the city and the ‘break’ that modernism represented which for around three decades dominated discussions in urban design. Similarly, Perez de Arce (1978) uses a segment from Nolli’s map (with the colours inverted as in the figure ground drawings of ‘Collage city’) in a sequence that reduces the map to only monuments and their correspondent open spaces, to finish with one showing only the monuments. In this graphical simplification, he shows how the role of the monument in the case of Rome lays in its public interior, but also in the way that it has a correspondent open space in front that contrasts with the structure of irregular streets around it. With the last drawing showing only monuments he explains “the impossibility of urban order when the city is only constituted from isolated buildings of monumental character”. He goes on to apply this to the capitol area in Chandigarh, affirming that it misses the surrounding poché. His proposal introduces the poché with new blocks of buildings that will enclose and contrast with the monuments, creating at the same time their correspondent open spaces, emulating the type of space that he illustrated with Nolli’s map.

The use Venturi, Scott Brown et al (1977) make of the Nolli type of representation in their study of Las Vegas’ Strip illustrates the intermezzo, as has been already mentioned previously. The authors use the Nolli map in two ways. First, in a collage showing how the order in Las Vegas is given by signs that structure the way spaces and hierarchy are perceived: “the iconography, rather than the space and piazzas of historical architecture, forms the background for the study of association and symbolism in commercial art and strip architecture.” (Venturi, Scott Brown et al. 1977) Second, they develop a Nolli map of the strip showing how the public elements are the casino halls. In this case, the gambling person would be equivalent to the pilgrim of the eighteen-century Rome. By elaborating this map, a new element appeared: the large parking areas. The parking lots are the sign of a new order, given by the experience of the automobile and enlarging the scale of study. “Two decades later architects are perhaps ready for similar lessons about large open space, big scale, and high speed. Las Vegas is to the Strip what Rome is to the Piazza”. However, the most important element of the experience of Las Vegas, ‘the sign’ cannot be recorded in the Nolli’s type of map: “… the description like in Noll’is map, misses the iconological dimensions of the experience” (Venturi, Scott Brown et al. 1977).

The last reference to Nolli’s map exemplifies the last period, the city as the coming together of multiple processes, information and actors: “Nolli wouldn’t know where to begin. Were he to be given the task of mapping the late twentieth-century city, none of the conventions that he refined and which have permeated the history of urban visualization would be adequate to fulfill the informational requirements of contemporary urbanization. The familiar poché that serves as an index for the material density of the city, the markers of private or public space that distinguish inside from outside, and the monumental and civic icons that serve as points of orientation or focus would be little more than obsolete gestures towards faint memories of urban ideals” (Leong 2001). This text, extracted from the ‘Shopping Guide’ by the ‘Harvard Project on the city’ is part of a thick book containing all sort of maps using data, collages, time plans, schemes and photographic reportages, exemplifying the recent mapping boom and context of that boom.

![Figure 48. From the Harvard Design School guide to shopping (Leong, 2001).](image-url)
6.2. Signs and techniques:

After having elaborated on the contexts of the reviewed studies, it is time to look to the technique with which studies have mapped their ideas. Maps are combinations of signs using specific techniques. The process of mapping involves a technique, it involves the selection of a base map, selection of information to be represented, and decision on the best way to communicate it, or make it understandable. As Harley and Laxton explain, maps use signs and conventions and there has been a lot of effort put into standardizing these systems of communication of maps (Harley and Laxton 2001). Because the maps reviewed are manipulations done mainly by architects, urban designers or planners, they are less guided by cartographic conventions and more by the will to communicate a design or to extract useful information for a specific purpose. They are also very much designs themselves. Lately they have even become manifestos, new explorations; specially those from the last period reviewed (city as process). Most of the studies use a multiplicity of techniques and that is why the studies themselves are only mentioned as examples and a more abstract list of techniques is extracted.

In relation to the mapping of urban form, there are specific scales, themes and techniques mapped that constitute the basis for a morphological study. The study of urban form uses maps of historical reconstructions, or sequence of historical maps. It also uses maps where information of the specific scales and units in each scale are found: at least the parcel division, buildings footprint and the street network and blocks. These maps are then manipulated and compared. This section does not go into detail specifically about the techniques of the morphological approach but it discusses general ways to deal with maps, which in many cases are applicable to map very different and diverse aspects.

There are three techniques which use and work with the topographical map. In the first, the topographical map is manipulated in the sense that information is extracted, selected, omitted or split into separate layers. In the second, information external to the topographical map is added or mapped independently from it. In this way, the map can also be transformed in the sense that features from the topographical map acquire different hierarchies through the combination with other types of information. The legend becomes very important; colours or thicknesses of lines can represent different quantities or attributes. The third technique is when the topographic map is distorted, on basis of quantitative information. Besides these three, there are identified techniques that do not use and work with the topographical map but that are interested more in relations. This is done by mapping with text, but creating time lines or by generating abstract schemes.

6.2.1 Dissection of the map

This technique consists of extracting and manipulating information from a map and putting them into a new one. New maps are drawn with selected types of information. From this manipulation, conclusions that might not be evident when looking at the map for the first time with all the information at once can emerge. The manipulation of the topographical map can involve selecting specific issues or separating them into different layers. These can form sequences of maps. The layering of different types of information into separate maps is practiced in all type of studies since it allows discovering the structure of the different components and the specific logic of each component. It might also show relations or causality between different systems. The criteria for selection and division into different layers can vary. Some examples are mentioned in the following paragraphs.

Layers of different systems:
The main physical features of a place are recorded in the topographical map. In this map information like streets, buildings, green areas, water, and public transport lines are represented. These features, or specific selected ones, can be separated or drawn independently from each other in different layers. For example, in the morphological analysis one of the basic techniques is to use maps of only streets, only buildings, or only parcels. The same is done in studies of the dispersed city or of new urban agglomerations or urban regions where different logics combine to produce the territory. By understanding them separately it is also possible to understand the way they work together producing the urban reality. In the cases of mapping urban regions we see how important are the layers containing natural elements: water, mountains, ground structure, built and empty areas, and the road networks of different scales that cover territories in specific forms.

This separation into different layers can be done at any scale. One example of the way this is done for the scale of a whole city is the study by Palmboom for Rotterdam (1987) which shows that the fragmented structure of the city of Rotterdam is the product of different colliding logics: the structure of the ground (or the landscape) together with the water and the ‘traffic machine’. This example also shows that the understanding of these different layers and the way they relate in this case in the city of Rotterdam can lead to insights that explain the way developments occur, or the problems generated by the confrontation of these different systems. By representing in different layers different issues, problems of colliding logics can become visible for a specific area. A simple separation of functions into different layers, when observed in the map, allows finding clusters, axis, and directions in the actual distribution of functions in an area, and in the same way, allows highlighting tendencies and future scenarios.
Figure 49. Oswald, F., P. Baccini, et al. (2003). Netzstadt: designing the urban.

Figure 50. Rotterdam explained with the aid of three main layers, from Palmboom, F. (1995). Rotterdam, verstedelijkt landschap.

Figure 51. Hoog, M. d. (2005) 4x Amsterdam ontwerpen aan de stad.
Figure 52. Boeri, S., E. Marini, et al. (1993). Il territorio che cambia. Ambienti, paesaggi e immagini della regione Millanese.


Figure 54. Layers by patterns for Kopenhagen. From: Geurtsen (1981).
Figure 55. Diener, R., Institut Stadt der Gegenwart (ETH Studio Basel), et al. (2006) Switzerland: an urban portrait.

Figure 56. From: Frijters, E. Frijters, E., D. Hamers et al. (2004) Tussenland.

Figure 57. Layers, from 4. Edzo Bindels, Ruurd Gietema, Henk Hartzema, Arjan Klok (2000).
Layer of time:
Maps can also be separated into different layers in relation to different periods of development. Sequences of maps can be drawn of a specific site and the way it has been occupied at different moments. These different periods can be compared and this basic comparison allows observing change and permanence. It is a way to understand consequences of different actions and decisions and the way they affect and transform the physical environment of the city.

Layers of patterns: Separation into homogeneous areas
The plan units of Conzen (1960) are a good example of the way a map can be divided in different areas that relate to different morphological units: areas with specific homogeneity related to their morphological configuration and development. Although Conzen did not draw the different units separated, this can be done in order to understand the specific inner logic of each of the areas. For example, in the study of ‘Paris les Faubourgs’ by Lucan (1996) we can see how by drawing exclusively the area of these faubourgs, the first ring of Paris, the coherence in the way the different urban settlements along this ring developed and in their specific urban patterns is clear.

When separating different patterns, it is possible to observe for example lineal structures, lines of infrastructure that give structure to areas and direct and influence their transformation. One example in the study of Milan’s agglomeration (Boeri, Marini et al. 1993) is the ‘strada mercato’ (market street) where new types of developments and big containers of mainly retail activities are located along sections of regional roads. Another example is Gandelsonas’ X Urbanism (1999). His drawings for Los Angeles and New Haven show specific linear structures. Elements of the same type that are organised along a line and that are affected by their vicinity to this line have developed homogenous characteristics.

6.2.2 Additions to and combinations of maps
In this technique, a base map is used to map other types of information than included in the original. That information can be of a quantitative type like data about a place, or it can be qualitative assessments. Varied types of information can be assigned to locations by relating them with geographical features of the map.

Data added to map
In the first place, we can mention the possibilities that GIS offers of linking databases with maps. Information is assigned to specific locations. In GIS systems, a map can contain data assigned to points, lines or areas. The data can be added as colour-coded values, thicknesses given to lines, or simply by adding tables of information, ‘pies’, diagrams or graphs; all this is based on a legend. In this case, the construction of the legend is what matters most and within this, the selection of the ranges of data used. Other types of information that can be added to a map can be in the form of icons. In this case, areas can be characterized, can be labelled or can even be qualified based on specific criteria.

Figure 58. Addition to map: functions. From Frijters, E., D. Hamers et al. (2004) Tussenland.
Overlapping of maps or scales:
The maps by Must for the Atlas of change of Netherlands (Must 2000) and for ‘Nederland Netwerkenland’ (Must 2000), which were cited in the previous chapter, when discussing mapping perception, show an overlapping of different types of information and scales within the same map. We see the opposite of the procedure of layering. While separating layers is splitting information in order to understand it separately, isolated from one another, in this case different types of information are put together. The maps of these examples overlap different scales in one map in order to show the experiential space of a specific person. In that experiential space, locations which are not necessarily contiguous or not even in the same country can belong together as part of the experience space of one user.

Another way of overlapping different types of information in a map can be done when studying a specific site. In this case the unifying element is the site while many types of data and information are overlapped in the map to give an overview of varied features of that specific site or to derive conclusions about those features or their relations in that site.


Figure 60. Addition- Overlapping From: Must (2000). De fantastische structuren van gebeurtenissen.
Figure 61. Distortion of the map, from www.worldmapper.org

Figure 62. ‘New Spatiotemporal map of Rotterdam’, project by Scape (urban design office in Rotterdam) in collaboration with V2 (Institute for the Unstable Media) for the Rotterdam municipality. The same procedure applied to Amsterdam (right). From Boer, F. in Archis 2 2004.
6.2.3 Distortion of features, measures or distances in the topographical map

In the previous example, the basic characteristics of the topographical map remain while more data are added to that map. In this section, those basic characteristics are transformed or distorted by the use of data. Among the examples are the maps of the ‘Worldmapper’27, where an algorithm is developed to scale the area of countries in relation to other type of data. Here we can see and compare the area of countries transformed in relation to data like population, wealth, exports, but also to data of more contemporary interest like international demonstrations or fast food restaurants. This allows having a vision of the world and the relation between countries for varied issues. Another example, very much used recently, is when maps are distorted in relation to distances in time. Examples of these were shown in the previous chapter in ‘mapping time’.

Distortion of maps can also be done by adding a third dimension to a map where the Z axis represents another type of data. A relieve is created which can show a new geography given by specific features. One example of this is the series of maps by MVRDV for the Costa Iberica (MVRDV 1999) where information about density gives different elevations to different areas of the map. Similarly, the Venice Biennale of 2006 compared fourteen different cities in the world with similar maps and models and it showed in relieves the density of these cities.

Caricatures

Another form of distortion of the map is by creating new maps in caricature where certain features or characteristics of an area are exaggerated. This type of maps can be seen for example in the drawings by Neutelings for the Antwerp ring, for the carpet metropolis, or in general the drawings used by Neutelings and Riedijk28 to illustrate their design projects. Similarly, this is the case with the drawings by Palmboom & van der Bout29 for their analysis and presentation of design projects. These drawings have the expression of cartoons with clear colours and drawn most of the times in axonometric in order to make clear the main issues of an analyzed site or a design proposal. The drawings from ‘A room with a view’ (Houben and Calabrese 2003), picturing the frame of the front window of a car with different views of the road, are also an example of this caricature type of mapping.

28 Neutelings and Riedijk is an architecture office based in Rotterdam.
29 Urban design office based in Rotterdam.
Figure 65. Timeline from Jencks (2000).

Figure 66. Design Genres vs market Share Design vs arket Share, from OASE 67 (2005).

6.2.4 Comparisons and timelines

In order to be able to establish comparisons, basic procedures need to be followed like simplification of drawings of areas, and specially, homogenization of scales, legends and colours that will allow comparing specific aspects. Comparisons allow getting an idea of scale for the studied area in relation to others. Recently, the many atlases of urban regions often include comparisons within their collection of maps. The explanation of this can be found in the need to position these regions in the map (see 5.1 New Atlases). These comparisons are most of the times no longer about only physical aspect but they involve data of many types incorporated into the map or complementing it.

Another way of comparing is by making timelines. Recent publications also commonly have a time line where different events are located, in relation to a place, or a specific area. In the 'Guide to shopping' (Chung, Cha et al. 2001), the different developments and changes in the typology of shopping in relation to different historical events are placed in a time-map: “Contour maps no longer describe geological features but altitudes of money.” “Peaks and troughs” are no longer physical changes in terrain, but represent a topography of market potential, indicating levels of income and spending” (Chung, Cha et al. 2001).

The same is done in Content (Office for Metropolitan Architecture, and Koolhaas 2004) for a selection of events of the period between 1989 and 2003. This time-map contains images of events of that period together with the Dow Jones and corruption indexes. Similarly, in the issue of OASE about the state of the art of Dutch architecture and urban design in 2005 (Mulder and Koehler 2005) the different approaches, important projects and events are also located on a time line. Another time line maps the amount of pubic and private commissions of architecture offices in relation to architecture style.

In general, the design of the time line and the location of all the elements and the selection of what to incorporate is a way of mapping. It locates a project in relation to events or other locations or in relation to other projects; it is a way to contextualize events or locations but also to show their specific position in comparison to the situation at a specific moment and the process around it.

Figure 68. Comparison New York, Shanghai. From Panerai, P. (2008) Paris métropole : Formes et échelles du grand-Paris

Figure 69. Comparison. From After Sprawl, De Geiter (2002).
Figure 70. Lineal Atractors. From: Boeri, S., E. Marini, et al. (1993). Il territorio che cambia. Ambienti, paesaggi e immagini della regione Millanese.

Figure 71. Schemes Atributes of urban systems, from Oswald, F., P. Baccini, et al. (2003). Netzstadt : designing the urban.

Figure 72. 4. Edzo Bindels, Ruurd Gietema, Henk Hartzema, Arjan Klok (2000).
6.2.5 Abstraction schemes

When principles of a more general type can be abstracted from the study of a specific urban area, it is possible to draw schemes of those principles. These types of schemes contain simplifications that allow understanding the essential elements in the transformation of an area and the essence of the relations between these elements. Consequently, in these schemes the features of the cartographic map like dimensions and real distances in scale are less important; rather relations are more relevant in these schemes. Often the schemes which abstract principles are used as conclusive maps of a study or as a way of communicating to other people specific characters of a site; a way to summarize a discussion about a site.

One example is the study of the Milan region (Boeri, Marini et al. 1993), where the recognition of some principles which are repetitive allows the authors to define transformation principles. These repeat through the territory and therefore can be abstracted. In this specific study, the authors draw schemes of the following ‘urban facts’: lineal attractors, pins, islands, cloning areas, inserts and gradual metamorphosis. The development of a term to name those ‘facts’ is part of the act of schematizing a situation and abstracting those principles.

6.2.6 Mapping with text:

Similar to the abstract schemes, we find maps that play with text. These are maps composed of texts, located in space and playing with the different types of relations between words. These words indicate places but they are mostly attributes or adjectives to characterize a location. One example is the maps of Europe in USE; these maps are not using elements like lines, points or surfaces to map, but they use texts. These texts have different hierarchies, sizes and fonts and in that way they show relations and compose a map that shows the spatial relation between the different statements.

This way of mapping with text is observed also at the scale of architectural projects where the program and functions proposed for specific spaces of buildings are represented with texts that describe them. In architecture, this tendency shows a change of outlook where form or appearances become less relevant and strategies, programme, actors and forms of development become protagonist. In that way the text shows how the form or the appearance of a building or space can vary, or is not defined, while the program and the relation between the programmes is what matters.

Figure 73. Boeri, S. and Multiplicity (2003). USE: uncertain states of Europe: a trip through a changing Europe.
Figure 74. Signs in Las Vegas. From: Venturi, R., D. Scott Brown, et al. (1977) Learning from Las Vegas: the forgotten symbolism of architectural form.

Figure 75. Mapping with text. From: Edzo Bindels, Ruurd Gietema, Henk Hartzema, Arjan Klok (2000)

Figure 76. Mapping with text. From: Koolhaas, R., H. P. o. t. City, et al. (2000). Mutations
6.2.7 Photographic reportages and interviews:

Recently, another way to map the built environment has emerged with the help of photographic reportages. These reportages attempt to show the changes of the image and perception of the built landscape when a user is experiencing that space. They are also looking to record the everyday experience of inhabitants or of specific groups of users of an urban space. These photographic reportages are also a way of mapping since they carefully put together different types of information in relation to a site. Most of the examples show how the selected group of photographs develops a story, the selection of the images and their location in a document is designed in order to communicate an idea at a higher level of generalization than each image alone.

Photographic reportages often concentrate on those elements of the landscape that are new, as is the case with G. Basilico (1998) who gave special attention to the Italian peripheries, those areas that could be described as ‘generic city’ along highways: big commercial facilities, street signs, and anonymous housing blocks. Basilico’s photographic reportages show anonymous areas that could be located anywhere in Europe. In ‘Italy, Cross sections of a country’ he attempts to show through the photographs “the persistence of extended-family networks and their power to organise the new settlements in the vast areas of the extended city” (Basilico and Boeri 1998).

In a similar way, T. Baart in the Atlas of change (Baart, Metz et al. 2000) shows those new spaces which could only possibly exist in the contemporary city: a ski hall over an old garbage leap, recreational farming, etc… In this case, he also defines new terms to name these new spaces and calls them ‘the language of spatial planning’.


Figure 79. From: 64 MINUTEN IN 3 SECONDEN. De hogesnelheidslijn door Nederland, Verweij, L. and J. Konings (2002).

Figure 80. Mobility a room with a view, Houben & Calabrese (2003).

Figure 81. Project on the city 2. Harvard Design School guide to shopping (2001).
### Themes

- Kahn, L. Plan for midtown Philadelphia
- Cullen, G. The Concise Townscape
- Devoid, G. The Naked city

### Sign and Techniques

### Context of the Mapmakers

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### Table 4: Comparative table of recent approaches to urban form

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<td>Chung, Chuihua Judy (ed.),</td>
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<tr>
<td>1994</td>
<td>Gutierrez, L., Portefaix, V. &amp; Koor, A.</td>
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<td>1993</td>
<td>Themans, M.</td>
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<td>1992</td>
<td>Bergweg, New notation systems for urban situations</td>
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<td>1989</td>
<td>Bergweg, New notation systems for urban situations</td>
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6. 3. Signs and techniques in relation to contexts, attitudes and mapping thematic

Two different contexts have been identified. The context from the 1960s that framed the emergence of the traditional urban morphological approaches and the context of today that frames the studies in the form of the landscape and the territory but also within a large list of different themes studied in the context of other maps. The move from one attitude to another is not traceable with a line. Therefore, we call the transition period, ‘intermezzo’. However, attitudes about both are still present today in approaches to the urban.

A correspondence can be established between techniques used, mapped themes and context. This is of course not absolute to all studies but it can be identified as a tendency. The studies about urban form, whether traditional ones or recent ones, deal with the topographical map by dissecting it in different layers or extracting specific information from it. One of the qualities of the recent studies is that they have compiled maps with physical information for regions that sometimes did not even exist, since those regions many times do not coincide with administrative or political borders.

Similarly, in relation to the current paradigm of processes and relations, identified here as the context of the recent maps, it is thought that mapping perception, data, flows and time is more important than form. Accordingly, the techniques also refer to an attempt to map processes and relations while formal aspects are less relevant. Mapping text is a very clear example where position and distances between texts as well as sizes of fonts denote degrees of relation and degrees of hierarchy rather than physical space. The same occurs with maps that distort the topographical map. In these maps, there is a reference to physical space but this is altered by other non material aspects.

6. 4. The review in relation to the new vocabulary to name the contemporary city

In general, a clear correspondence is visible between the important themes, characteristic of the contemporary city developed in chapter 2 and the studies about it which were reviewed in this part. This correspondence occurs at two levels.

First, the two positions about the form of the city indentified in the review of the vocabulary are also found in the review of mappings. On one hand the two positions which are in favour and against the relevance of the form of the city appear again in the themes mapped. Many of the mappings of data, flows and time demonstrate the diminish importance of questions of urban form. This is also visible in the techniques and character of the maps which also shows those two different positions.

Second, in relation to the form of the contemporary city, the review of different studies shows commonalities with regards to important themes, which can also be found in contemporary urban form. These were also identified in the vocabulary. To start with, the binding role of the open space in structuring suburban neighbourhoods.

The emergence of new scales in which an urban area is involved, the global scale or the inter-regional, among others, is also reflected in the recent maps. Because of this, so many atlases are produced, but also studies of specific urban region include maps at larger scales and comparisons across the whole world. The proliferation of new atlases allows observing the role of mapping within the consolidation of the scale of urban regions, collaborations between regions, tourist routes etc. and all entities that re-group and enlarge in order to compete with other regions or similar entities. It seems that in all the cases mapping becomes a way to warranty, to have proof of or to visualize something that before seemed inapprehensible.

In those cases, we can think that mapping is again playing the role it had in the discovering and conquering of terra incognita. Mapping as proof of the existence of something new but also as a way of apprehend something which was not known before. Mapping is still related with revealing something new, as the maps of the new colonies were. We need to map in order to show and to comprehend. But the mapping does not only reveal something new but it also reveals ways to act. In this way, during the 1970s the historical centres needed to be carefully recorder in detailed maps and this generated a strategy for conservation and intervention. From the 90s, the dispersed city needed to be mapped on the one hand in order to be accepted and on the other to establish that the intervention strategies which were needed there were not the same as those needed for the compact city. Today, the new atlases need to map those global, trans-national and regional orders that are influencing the current urban condition in order to, via its visualization, devise strategies to act.

Second, in relation to the form of the contemporary city, the review of different studies shows commonalities with regards to important themes, which can also be found in contemporary urban form. These were also identified in the vocabulary. To start with, the binding role of the open space in the contemporary city is very clear in all the studies of the form of the territory and the landscape. Even the studies in the North American suburbia recognize the role of the open space in structuring suburban neighbours.
a ladder. Furthermore, the idea of in-between is a key to approaching relevant issues in the contemporary urban landscape. As Berger affirms in relation to his term ‘drosscape’, which was coined after the essay by Lerup ‘Stim and Dross’ where the potential of those ‘in between surfaces’ are discussed. Berger goes on to plea for an intervention in that drosscape, as a way to “improve regional scale deficiencies”.

6.5. To continue with mapping case studies

In the first place, it seems important to clarify once again the position of this research about the different attitudes identified within the different contexts and themes. As explained in chapter two, this research argues for the necessity and validity of studying urban form today, moreover in areas of the contemporary city. The review of the studies in the previous chapters showed us that there are two different attitudes with regards to urban form. One that defends a relative autonomy of urban form while the other defends its relevance accepting that many other issues are also relevant in understanding the contemporary city. This research is more in line with that last position, and it assumes that while we are concerned with urban form, it is one within a multiplicity of elements in play in the contemporary city. However, it is also argued that as urban designers, we can use urban form as the entrance to approach the complexity of the contemporary city.

After the initial clarification, this section will deal with specific conclusions from the mapping review that constitute the departure point in the mapping of the cases.

Within the general definition of urban morphology formulated here, supported by Moudon’s texts (1994; 1997), we could study any urban area and analyze it on bases of form, resolution and time. This abstraction by Moudon does not imply any type of city, neither a specific scale. She also has affirmed that when studying the North American cases, it has been productive to use the tools of the morphological approach to look at the suburban reality of North America (Moudon 1998).

Furthermore, the review shows a large amount of studies produced mainly starting from the 1990s in the morphology of suburbia, the landscape, and dispersed urbanization, and in general, urban form which shows differences from the traditional city. The three main schools, and in general the consolidated stream of urban morphology also began studying contexts outside Europe and North America as well as the recent developments. For example, the studies within the French school of the Metropolitan area of Paris (Panerai 2008) and the banlieue (Lucan 1996) show how urban morphology can contribute to explaining spatial configurations which are different from those in central Paris. These examples also use the main concepts, form, resolution, and time in their maps.

For this reason, the mapping cases start by collecting and developing the basic techniques from the morphological approach. The structure of the parcels, buildings streets and blocks will be the base of the cases as the main elements of the form. These will be observed in different scales and in the dimension of the transformation in time.

Moreover, the review of the morphological approach also shows the emergence of specific themes which offer possibilities within the aim of this research. The first of these is the idea of ‘tissue urbain’ from the French school that shares some elements with the ‘plan units’ from Conzen (1960) and with the ‘homogenous areas’ of the Dutch case. It seems possible to identify homogenous areas in all different types of urban developments, independently of whether they are historical of compact centres as it was done for example by Conzen for rural and suburban areas of Alnwick.

The correspondences between the conclusions of the review of the vocabulary in chapter 2 and the review of studies in urban form in chapters three and four show that themes such as the open space and the in-between areas need to be considered in the cases. Therefore, the open space as binding element at the regional scale, the in-between spaces, the physical borders or other types of borders in the way the affect urban form, infrastructure and the way it facilitates growth and transformation, are the subjects that with the aid of traditional morphological tools will be researched through the mapping process. The observation of these features can complement the observations of homogeneous areas or plan units by adding those spaces without homogeneity or a recognizable physical pattern.

Perhaps if we reflect on the descriptive terms and adjectives that have been assigned to the contemporary urban landscape, such as ‘fragmentation’ or ‘lack of structure’, the idea of the plan units (where plan units are also the agricultural land, or pre-urban developments) may suggest a way to tackle that fragmentation and decipher its logic: each plan unit can be seen as one of the fragments of a puzzle. Between the fragments, the fringe belts or in-between areas form a new layer that gives structure to an otherwise unclear regional entity. This approach can also reinforce the idea that most types of urban developments that extensively cover the contemporary urban territory are not totally new. They are new ways to group and organise existing types, or expansions, into critical masses or critical dimensions. An examination of the evolution of each plan unit enables us to see its origin, or a comparison of plan units and their evolution may help us to see previous stages of areas that have already been consolidated, for example in actual dispersed areas.
The necessity to map scales of a higher order shown in the studied maps and in the vocabulary review tells us something about the subject of borders. This corresponds also with the idea of the disappearance or redefinition of borders. The mapping of the cases need to give attention to the different borders and the way in some cases they are not relevant anymore while in others they can have large influence in the urban form. The mapping of urban form can relate to these issues by studying the physical aspect of these new or old borders.

In relation to the network society and the invisible connections, what we can observe, from the point of view of urban morphology in relation to this space-time compression, is the space that is left between those connections, the areas which are being affected and in a way broken by those connections at higher scales. This is to map the marks in the landscape of these communication technologies that have redefined the city and the everyday experience of its inhabitant and to map the spaces which become isolated either because they are not connected or because they are disconnected by connections established at a higher scale.

Through the act of being mapped, the effects of urbanization and the transformation of the urban landscape become visible. Furthermore, the mapping act generates awareness of it. Like Berger says, “Measuring the dynamics of urbanization in order to see the effects on the landscape is a representational issue” (Berger 2006).
PART 3. Mapping cases

No two events are alike in everything, but we compare them in those aspects that matter for the purpose at hand, or, in those that matter for a collection of purposes. We therefore also compare things which in other aspects are not comparable. Karl W. Deutsch, 1985

The mappings analyzed and compared in the previous part are all inscribed within different contexts and developed for multiple purposes. In this part, the author develops mapping in two study areas, the urban regions of the Bogotá-Sabana region in Colombia and the Randstad in The Netherlands. The explanation for the mapping of case studies makes reference to the main aim of this research, which is to develop a generalized knowledge about urban form in the contemporary urban landscape. The cases apply the conclusions derived form the previous chapters to specific cases. These conclusions derived from the review of the different terms used for referring to the contemporary city, as well as from recent mappings. They show a repertoire of themes and sites which characterize the contemporary city, which are different from those in the traditional city. The mapping of case studies identifies those new themes and sites in the studied regions, in order to compare them and to generate later generalized conclusions from the comparison.

This part is composed of two chapters. The first one introduces the two regions as well as the specific mapping methodology. The second is the atlas, containing the maps with explanatory texts.
Chapter 7.

Mapping cases, preliminary settings

This chapter introduces the context and the basic components of the case studies. In the first place, it offers an overview of the two studied regions: Bogotá-Sabana and the Randstad. This overview introduces the two contexts at a general level and the process of urban development in more detail. Further on, the chapter introduces the approach used for the cases and the basic elements taken into account through the mapping process. It explains the objectives of the comparison, the selection of the cross-sections and the procedures followed in the mapping activity. The chapter also enounces the specificities concerning the base maps and scales used. Therefore, this chapter prepares the ground for chapter 8, which contains the maps for the two cases, the abstract schemes and the comparisons between them.
7. 1.  Introducing the two contexts: Two urban regions, two different spatial configurations

The two regions will be described in the following paragraphs in terms of their main geographical characteristics, spatial configuration, transformation and planning mechanisms. The description is summarized because the main goal of this chapter is to study the maps of specific cross-sections and of selected detailed areas within them. At the end, a deeper description and understanding of the regions will emerge based on the conclusions derived from the map analysis. The initial introduction of the two regions attempts to show the general context. The specific features and the differences between the two regions will become more obvious and filled in with more details, after mapping, explaining and describing specific areas within the cross-sections. Similarly, the planning mechanisms and urban transformation processes for the two regions are described at a general level and they will be studied more in depth in connection with urban form through information extracted from the maps. This will allow showing, with specific examples, the differences in ways of intervention and planning between the region of Bogotá-Sabana and the Randstad, from the viewpoint of the morphology.

A clarification seems necessary in relation to the use of the term Randstad. The term itself is a source of controversy. Questions about whether the urban agglomeration of west Netherlands to which it refers is really a ring-city, or other terms like that one of Deltametropolis, or the report by the RPB ‘Veel steden maken nog geen Randstad’ (many cities don’t yet make a Randstad) (Ritsema van Eck, F. Van Oort et al. 2006) exemplify this discussion. Since the term is already known worldwide, and it has gained relevance again in the Netherlands because it is included in the last national spatial report, the term Randstad will be used in this research to refer to that urban agglomeration of the west of the Netherlands without assuming a position in that discussion.

<table>
<thead>
<tr>
<th>Bogotá-Sabana</th>
<th>Randstad</th>
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<tbody>
<tr>
<td>The region of Bogotá-Sabana is a plain territory, bordered by mountains where the city of Bogotá (capital of Colombia) and 19 other municipalities of a more rural character are located. These constitute an urban region that even if not defined in juridical or administrative terms, exists functionally, spatially and geographically. (CEDECAF-DAPD 1999; Bogotá 2000; D.C. 2000; D.A.P.D. 2003)</td>
<td>The Randstad region is the main urban agglomeration of the Netherlands. Its main characteristics are a network of 4 main cities and many smaller towns with a green heart\footnote{The ‘green heart’ is the name given to the area in the middle and between the four main cities of the Randstad. This area is of a more open character than the surrounding urbanized area.} in the middle. Although administratively the region does not exist, it constitutes an urban region in natural, economical and spatial terms. At a national scale, it is the most urbanized area of the Netherlands, concentrating a significant amount of population and economical activities, containing the main port and airport of the country and of North Western Europe.</td>
</tr>
<tr>
<td><strong>Basic data:</strong> (D.A.P.D. 2003)</td>
<td><strong>Basic data</strong> (REGIO.RANDSTAD 2007):</td>
</tr>
<tr>
<td>- Population 8.2 million inhabitants</td>
<td>- Population: 6.7 million inhabitants</td>
</tr>
<tr>
<td>- Surface area (x 1000 ha) 406 (source CAR\footnote{CAR: Corporacion Autonoma Regional})</td>
<td>- Surface area (x 1000 ha) 542</td>
</tr>
<tr>
<td>- Urban Area: (x 1000 ha) 46.68</td>
<td>- Urban area (x 1000 ha): 140</td>
</tr>
<tr>
<td>- Urban area 11.5 % of total area (this data is based on the perimeter DANE\footnote{DANE: Departamento Administrativo Nacional de Estadistica} for urban area in each municipality. Therefore, in some cases suburban area developed outside this perimeter is not counted)</td>
<td>- Urban area 26 % of total area</td>
</tr>
</tbody>
</table>

30 CAR: Corporacion Autonoma Regional
31 DANE: Departamento Administrativo Nacional de Estadistica
7.1.1 Natural elements

Bogotá and the Sabana are located on a plateau at the height of 2600 meter above sea level. This plateau is crossed in the middle by the Bogotá River, and contains smaller valleys of other rivers, all of them tributaries of the Bogotá river. The plateau is limited by a mountain belt, part of the Andes, reaching some of them in the east, north and south up to 3200 meters above the sea level.

The Randstad is located in the west of the Netherlands, having the North Sea as border with sand dunes as its coast. It is a Delta of the rivers Rhine, Maas and Schelde. The ground is mainly composed of peat and clay, mostly product of successive land reclamations. Because of this, it is also the lower area of the Netherlands, with a large amount of land below the sea level.
This region has a monocentric configuration. Within the plateau, the Bogotá river marks the division between the large city of Bogotá on the east, and the other municipalities of the Sabana, west of the river. Urbanization is concentrated in Bogotá, between the river and east mountain belt in a very compact, dense pattern, which nowadays does not have much free land available for urbanization anymore. The area west of the river is occupied with the Sabana, an area mainly dedicated to agriculture, due to the highly fertile land, with small towns connected by a road network. However, this idea of rural municipalities with small urban cores does not exist any more in reality. In the last decades, many activities from the city (recreation, schools, office areas, clubs, condominiums, etc...) are proliferating in the rural areas.

The main road network at the regional scale is mostly radial, from Bogotá crossing the Sabana towards other regions. Perpendicular to this radial configuration, there are semicircular rings of a lower hierarchy. These rings connect rural municipalities without crossing the large city of Bogotá. Recently these rings have been reinforced.

Summarizing, the spatial model at the regional scale consists of a very large centre against small municipalities all sharing the same geographical region with a road system emphasizing the idea of one centre and radial axes from there.

The Randstad is a polycentric region composed of four main cities: Amsterdam, The Hague, Rotterdam and Utrecht, and more small towns in combination with a green heart (open space). The four main cities and the other smaller towns are all interconnected by an infrastructural network of roads and railways.

Each city has a specific character and specific functions. Ports are located along the rivers connecting to the sea, the most important one being Rotterdam. The airport is located south of Amsterdam, The Hague contains the government, and Utrecht has a good offer of services and education, being the connection to the east and north of the country.

The green heart, the open area in the middle, is presented as an agricultural area which offers recreation and open space for the inhabitants of the urban areas around it. However, its open and rural character is under constant pressure due to urban expansion. Governmental policies attempt to protect it.

In short, the spatial model is a polycentric one, with four large centres of balanced proportion and other smaller ones, connected all with an infrastructural network and with a more open or less dense and less compact area in the centre.
7.1.3 Spatial Transformation

Around 1600, the region of Bogotá Sabana had a balanced configuration with towns located along the main connection routes (to the north, north west and southwest). These routes connected the city of Bogotá in the north with the city of Tunja and in the west with the ports in the Magdalena river, connection to the sea. Some of these towns even have pre-Hispanic origin. Their Spanish origins go back to between 1500 and 1800 and all of them have the colonial grid in their foundational center.

This balanced image between different small towns with compact character against a rural image of the region remained until the beginning of the 20th century. It transforms when the city of Bogotá experiences a large expansion particularly between 1870 and 1930, coinciding with its designation as capital of the country.

The type of growth before this period in the city but also in the small municipalities was through the addition of blocks to the colonial grid. Towards the end of the nineteenth century and until the 1970s, the model of expansion was one of complete neighbourhoods sparsely connected to the existent pattern, but spatially discontinuous from it, in a tentacle form with the main inter-municipal connection routes. This had already created many elements of urbanization by jumps, not contiguous to existent urbanization, and spread in the municipalities of what has been called the first ring (CEDE 1998).

The five municipalities of the first ring were incorporated in 1954 into the city of Bogotá with the creation of the Distrito Especial. Around the same time, some municipalities of the north area of the second ring showed the beginnings of suburbanization.

In the second half of the twentieth century, most of the urban expansion occurred. Bogotá filled almost all of its available land for urbanization. The municipalities that expanded most were those of the north and west conurbations, and the two regional poles of Facatativa and Zipaquira (CEDE 2000).

The process of transformation of the region has some major shortcomings. There is the limited road infrastructure that does not transform at the same pace with that of the urbanization. Just recently, the main routes connecting to other regions were given in concession to private parties to upgrade the roads to fulfill the requirements of the region and the city. Among the main characteristics of the current situation are the increasing unbalance between the urbanized areas in the limits of the city and the municipalities, but also the increasing suburbanization.

Around 1000 AD the area where the Randstad is located today was a swampy ground. Against these bad conditions, urbanization emerged. The reason for this was the very strategic location to forward goods from the sea towards the inner land and the other way around. The process of draining and claiming this area is one of the reasons of the polycentric character of the urban structure; ‘a land of water evolved into a land of cities, a highly urbanized area of different centers, each locally governed, which as time passed increasingly came to complement one another’ (Cammen 1988).

Engel (2005) describes four urbanizations periods in the constitution of what the Randstad is today, based on the four periods defined by Vries and Van der Woude (1995) for the urbanization along the North Sea cost. Within these periods, the configuration of the Randstad and the hierarchy of the different cities have changed a lot. The image we have today of a polycentric region where the different large and middle scale towns have comparable hierarchies has not always been there. It only appeared evident around 1870, in the fourth urbanization period, when the position of Amsterdam as the most important city of the region was equalled by Rotterdam that reached a comparable population of inhabitants, while Utrecht and The Hague also grew in population.

According to Engel, the foundation for the development of the Randstad was laid during the period of 1400-1550. In this period, most of the towns of the actual Randstad emerged in the periphery of the economical centre of the time, Flanders. Already in 1560 the population in the province of Holland was located in different size towns spread in the province. Van der Cammen (1988; 2003) affirms that by 1665, ‘the Randstad area functioned as one of the most important trading centres in Europe’.

However, the polycentric model did not stay that way. In the second period, Amsterdam became the most important port and centre of the region during the seventeenth century, locating at the top of the hierarchy of cities of the region. In this period, after Amsterdam, Rotterdam, Haarlem and Leiden also became important, having the first three designed expansions.

In the third period, around 1795, economic stagnation in the Netherlands caused depopulation in many small towns and an increasing importance of Amsterdam and Rotterdam as a result.

The current road infrastructure that supports the idea of the ‘ring-city’ (rand stad) started to take its shape in the second half of the nineteenth century with the laying down of connections between the ports of Amsterdam and Rotterdam and the industrial Ruhr area.

Finally, in the last period, the polycentric current

33 Studies in the spatiality of the region have characterized it as Bogotá in the centre and three rings of smaller towns surrounding it. Depending on their distance to Bogotá, these rings have a more or less rural character.
and the location of functions in relation to the city in the bordering areas of the Sabana.

Recently, the influence of Bogotá in the Sabana has become extreme. If we see the maps of areas left for urbanization within the limits of the city by the POT (Territorial Ordering Plan) of Bogotá, there is not much space left. As a clear consequence, every time more functions are located outside the limits of the city in the territory of the Sabana. An increasing amount of new dwellings also finds areas to develop in the Sabana, without developments in complementary functions or proper road connections. The image of a compact city against a rural area across the river has changed. Dispersed urbanization starts appearing especially in the areas of municipalities contiguous to Bogotá and along the main road connections to other regions. More remote municipalities are now used for second houses of Bogotá's residents and recreational areas. Industrial and agro-industrial activities have also filled the previous rural areas and some of the areas which are still rural are experiencing a process of abandonment of rural functions waiting for urban functions to take over them, paying higher land prices.

structure was consolidated. Firstly through the increasing population in a network of medium scale and small towns. In that sense, half of the population of the Randstad lives in the four main cities (Amsterdam, Utrecht, Rotterdam and The Hague), while the other half in 40 smaller towns and many more villages.

The current situation is the product of large urban expansion of each of the cities and towns accommodating the increasing population, the after war reconstruction, but principally the increase in the size of the dwellings and the diminishing of the index of occupancy. It tries to deal with the threatening of the open character of the green heart by multiple functions slowly occupying it and filling up the green areas between cities.

Figure 86. Urban development between 1950 and 1990 in red for Bogotá-Sabana region (left) and Randstad (right)
Figure 87. Transformation of urban occupation
7.1.4 Planning

The region of Bogotá and the Sabana do not exist administratively. This means that there is no planning for the scale of the whole region. The spatial planning occurs at the municipal level within the borders of Bogotá and each of the 19 municipalities of the region separately.

At a higher scale, all the municipalities are located in the department of Cundinamarca. This department has also a planning office which defines general guidelines. However, these guidelines do not concern Bogotá. Bogotá has a special position as the capital district, working independent from the department. Finally, at the regional scale, the CAR defines general guidelines for the rural areas of the municipalities.

The separation in the planning between Bogotá and the region starts changing at the end of the twentieth century. Discussions about the importance of the region, aiming at the creation of a regional agenda begin to take place. The following paragraphs will review the few attempts to develop a regional plan and the specific plans of the municipalities separately.

For the planning of the city of Bogotá, different authors identify three main periods (Cortés 1995; Saldarriaga 2000). In the first period (1906-1950) attention was given to the design of public space and in general to the spatial dimensions of the city. It was a type of intervention of a ‘drawn city’ (Saldarriaga 2000), basically using elements of urban design in the public space as the organizing and socially useful space of the city (Cortés 1995). Within this approach, the plan of Bogotá-futuro (1917-1923) was developed. This plan already contemplated an expansion of the city with a grid structure outside the limits into the neighbouring municipalities.

The second period (1947-1966) emerged as a reaction to the previous one which was criticised as formalist. It advocated a study of the different processes in play in the production of the city, and developing a complete plan for the whole city of Bogotá. This plan was based on the principles of the functional city and the ideas of modern urbanism. The office of the ‘plan regulador’ was created, hiring in 1949 Le Corbusier to develop the Plan Director. This plan was further developed, detailed and instrumentalized by the New York office of Wiener and Sert. It consisted of two main parts, the zoning and the street plans and it divided the city into different sectors. It already contemplated the necessity of a regional plan with the Sabana in order to provide a sustainable and balanced future for the city and the region. However, the dictatorship that took power in 1953 interrupted the continuity of this process.

The most relevant fact is that there is not one administrative unit coordinating or regulating the development of the Randstad region as a whole. The planning in the Randstad and in general in the Netherlands occurs at various scales. At the national level, the government defines the main spatial directions to be followed with the Reports on Spatial Planning. The next level is the provincial one. The Randstad contains areas of three different provinces: South Holland, North Holland and Utrecht. Finally, in the last level, the municipalities develop their own plans at the local scale. A very important characteristic of the spatial planning in the Netherlands is the decentralization and the power given to local governments that are by law responsible for the regulation of land use within their borders.

The Housing Act of 1901 is the first attempt by the government to regulate the physical development in the Netherlands. This act required municipalities to have an extension plan drawn. Municipal plans overlapped or had contrary objectives and sometimes extensions of the large cities involved annexations. The provinces initiated the thinking in regional terms, by bringing different municipalities to dialogue with a “little support” from an amendment to the Housing Act in 1931 which allowed for a regional plan (Cammen 1988; Cammen 2003). This small initiative evolved and in 1941 the province was granted the responsibility for developing regional plans to which the municipalities would have to adapt their extension plans. At the same time, the possibility for the central government to develop a national plan was established and some time later, the Government National Plan Agency was established in The Hague.

During the post-war reconstruction, the Randstad was one of the main tools for the economical reconstruction. This fact, together with the increasing population in the west of the Netherlands, product of the post-war period, migration to the west and the baby boom, urged the necessity of a plan for the area. In 1958 a committee created to tackle this problem presented a plan for the development of the west. However, criticism emerged from many actors as to whether such concentration in the west was convenient. Consequently, in 1960 the national agency published the First report on physical planning which gave emphasis to a similar and balanced development between the different regions of the country, but at the same time stimulated the development of the Randstad. The Randstad would concentrate the economical activity but maintaining the open areas between cities and the green heart.

In 1962, a new population forecast predicted 20 million inhabitants for the Netherlands in 2000. This high prediction and the increase in the required space per capita influenced the development of the Second national report in 1966. This plan continued the main themes
During the dictatorship, which developed a lot of new large scale projects for the city, the Plan Regulador was not taken seriously into account. Areas outside the perimeter defined by the plan were occupied. At the same time, in 1954, the Distrito Especial was created. This annexed to the city of Bogotá the five neighbouring municipalities and it constituted an expansion of the city into the region.

Since then, several plans were developed in 1957, 58, 64 and 65 until the plans Fase I in 1970 and Fase II in 1972. Fase II was the next attempt to include the region within the future projections of the city. It attempted to organize the areas that were annexed in 1954 by defining five centres. Even if these centres did not overlap with the original centres of the annexed municipalities, they were located in the outside ring in areas of those annexed municipalities. However, the high estimated population growth which constituted the base for this plan was corrected and when its prediction was not so high, expansion in the Sabana was not needed and the regional theme was abandoned (CEDE 2000).

In 1979, with the Plan General de Desarrollo Integrado, best know as Acuerdo (law) 7, the city enters the third period in which the growth and order of the city would be directed by economical factors and demands of the market. The focus of this plan was on the policy of growth, (to control the growth of the city) and the policy of urban structure, to develop tools and mechanisms to manage that growth.

Along these three periods, it is important to highlight that due to the size of the new population coming into the city, Bogotá developed two cities, the planned city, regulated and modernizing, and the spontaneous city, emerged parallel to the official planning. This process has also occurred in the neighbouring municipalities, particularly in the municipality of Soacha, but also in areas of the west conurbation (municipalities of Madrid, Funza and Mosquera).

The National Law 388 of 1997 on Territorial Ordering was an important event in the spatial planning of the whole country. This law requires every municipality with more than 100,000 inhabitants to develop a POT (Territorial Ordering Plan) and have it approved by the local council. However, inter-municipal or regional cooperation were hardly present and most of the POTs did not take into account the neighbouring municipalities. The Associations of municipalities of the Sabana stimulated the discussion between municipalities but it did not generate any concrete plan or policy. However, in the last decade, the necessity of a regional dialogue and communication in terms of the spatial planning was evident as many publications of research and reports show it. This might have influenced the creation in 2003 of the ‘Mesa de Planeación Regional Bogotá – Cundinamarca’ (Regional Planning Board Bogotá – Cundinamarca). This entity joined that had been enounced in the 1958 plan: maintenance of the green heart, the urban ring around it and the new expansion in new towns. It had as theme “concentrated decentralization”, to avoid the deterioration of the habitability conditions in the existing cities, the occupation of the green areas and suburbanization. This was to be achieved by defining the places where migration or new urbanization should happen within different living environments. This plan, because it was framed within a view of the Netherlands as part of the Western European urban agglomeration, sent the figure of the Randstad to the back and brought forward the thinking in a larger scale, in terms of two wings, north and south (Cammen 1988).

The Third report (1973-1983) reduced the high population prediction from 20 million to 17 and designated eleven poles for the location of the population growth. It also directed attention towards the depopulation of small towns and to the maintenance of the open areas. This report gave emphasis to the city-regions, tied together with public transport. At the same time, it started programs of urban renewal to tackle the migration outside city centres and the neglect of the existing housing stock. In this report, a special structural outline was defined for the development of the rural areas.

The Fourth document (1988) projected the Netherlands towards 2015 with the main issue of ‘spatial quality’. International competitiveness and attractiveness for international companies were the main concerns. To this aim, the figure of the Randstad was again powerful with the airport and the port as key areas. The quality of the housing offer was a key theme in the Vinex supplement (1994). New housing stock should be located in or contiguous to existent centres, connected by public transport.

The last national report, Nota Ruimte (2005-2006) defines the spatial direction of the Netherlands until 2020 giving attention to international competitiveness and attractiveness for investment and location of businesses. In order to do this, it gives more freedom and power to local governments and private initiatives. The government becomes more a partner of those initiatives than an entity defining rules (Sociaal-Economische Raad. 2004). In this report, the Randstad is highlighted as the politic, administrative, social and cultural heart, and the most important economical motor of the Netherlands. Consequently, the ‘nota’ gives directions to protect and stimulate the Randstad and its international competitiveness.

As a common point along the national plans we can see the desire to protect the open spaces and the green heart. This combines with a fear of suburbanization and with opposite positions of developing the main cities in the Randstad or spreading the development and
main activities uniformly in all the areas of the country. However, it is evident that in order to think in terms of international competitiveness, the figure of the Randstad is a key element. This is one of the standpoints for the just developed 'Randstad 2040 Structural Vision' that presents a vision emphasising in sustainability and reinforcement of the international position of the Randstad.

Figure 88. Above: POT 2000, Structure of the model for Bogotá. Under: CEDE 2000, Model for the Bogotá-Sabana Region

Figure 89. Images from the Nota Ruimte (2005) above: Main national spatial structure. Under: projects for the Randstad
7.1.5 Comparative observations

The general descriptions of the two regions show, as expected, geographical and situational differences between them, but there are also similarities. At the regional scale, in spatial terms, the regions are examples of two different structures, the Randstad is a polynuclear but Bogotá situated against the Sabana is a mononuclear. In the Randstad, the different nuclei are balanced; they grow at similar rates with comparable amounts of population. Complementary to this, there are smaller nuclei with a more or less rural character. The main characteristic is the infrastructure interconnecting them. This forms a circuit and is organized in a hierarchical way with national, provincial and municipal roads. On the contrary, the Bogotá-Sabana region is clearly a mononuclear structure with the big city, Bogotá, on one side against small rural municipalities on the other. The mononuclear character is also visible in the road network which is structured radial from Bogotá, through the region, towards the natural exits from the plateau connecting to other regions. Only recently the ring connections have been reinforced as is observed in the historical maps.

It is interesting to compare the spatial characteristics of the two regions with the basic data included in the beginning of the comparison. We observe similar amounts of population and similar dimension in area. However, the way these populations are distributed into these areas is completely different. This can be observed on the dimension of the urban area for both cases, showing how the Bogotá region follows a very compact and dense urbanization pattern, while the Randstad, seen always as a very dense area, is less dense in comparison.

In relation to the urban development, we see in the maps how for both cases, the second half of the twentieth century is the period where most of the land is urbanized. This is also the moment when the ideas of Modernism start being realized massively. In both contexts, specific events help this development. In the Randstad it is the war, and the post-war necessity of reconstruction. In Bogotá, it is 'el Bogotázo' (1948), the moment where the ideas of the modernist city become reality in the reconstruction of areas of the city centre destroyed by the crowd and the fire which was started after the murder of the candidate for presidency Gaitán. After this event, the plan of Le Corbusier and Wiener and Sert for the city in 2020 was commissioned.

There are also clear differences in scales, and scales of planning between the two contexts. Even if the Randstad does not exist administratively, the national spatial planning, because of the scale of the country can be involved with the figure of the Randstad, stimulating its development. In Bogo, a scale that could help define future scenarios for the region did not exist until very recently when in 2003 the 'Mesa de Planificacion' was formed. However, it was afterwards stopped and the current major of Bogotá agreed on reopening it. To this, we contrast the fact that the Randstad region can be part of a larger agglomeration of Northwest Europe, since urbanization continues outside the blurry borders of the Randstad. In the meanwhile, the Bogotá-Sabana region is clearly geographically defined by the surrounding mountains and the plateau, creating a natural region clearly differentiated by altitude and natural conditions.

In general terms, we can see how the Randstad shows a very direct relation between the plans and policies and the constructed reality, seen in this case from the point of view of the spatial and physical dimensions. On the contrary, the built reality in Bogotá and the Sabana cannot be so directly explained through what has been planned and designed. There the relationship between the plans and the reality is less direct. On one hand, the plans are realized to very small extents, and on the other, around the half of the city has been developed independently from the official plans (Saldarriaga 2000). That city is produced through different mechanisms.
Figure 90. Time table comparison of main features for both regions

Sources:
Bogotá historical maps (Bogotá CD, Museo de Desarrollo Urbano, 2000)
Bogotá-Sabana historical maps (CEDE-CAF-DAPD 1998)
Randstad: historical sequence under (Engel, 2005)
1538 - Foundation Bogotá
1500-1800 Foundation other municipals of region
around 1200 Amsterdam fishing village
1492 - Discovery America
Area of Sabana is occupied by indigenous groups from the tribe Chibchas
1400-1550 Most towns emerged
1901 - Housing act
1948 - Bogotazo
1949 - Plan regulador office created - Contract of Le Corbusier to develop plan director
1953 - Dictatorship
1954 - Anexation of 5 neighbour municipalities to Bogotá
2000 Model for the Bogota-Sabana region (CEDE)
2000 - POT of Bogotá
2003 - Mesa de planeacion Bogotá-Cundinamarca
1970 - Plan Fase 2
1972 - 1979 - Acuerdo 7 - Bogotá
1980
1988 - Fourth spatial planning national report
1990
1997 - Law 388 of Territorial ordering
1994 - Vinex
1950 - First spatial planning national report
1960 - First spatial planning national report
1966 - Second spatial planning national report
1973 - Third spatial planning national report
1994 - Brunner department of Urbanism summary of proposals
Plan Piloto Le Corbusier Wienner & Sert
2005-06 Nota Ruimte
2000-2003 - POT of Bogotá
7.2. Mapping and Urban form in the Bogotá-Sabana region and the Randstad: previous studies

7.2.1 Region Bogotá-Sabana: local studies and scarce regional view

The first study of relevance of the urban form for the case of Bogotá was developed within the ‘Mision Bogotá siglo XXI’\(^\text{35}\). This study (CORTÉS and SALAZAR 1992) developed three categories to characterize the transformation of the urban structure of Bogotá. These categories are: the traditional compact city, the lineal city, and the semi-circular city. The study also identified different processes of transformation that the city had gone through until then. These processes illustrate, for example, the constitution of a city with different centres, the aggregation of new neighbourhoods and their different types, or the relocation of activities and specialization of areas. This characterization is illustrated with maps for the whole city of the different types of developments. However, this study only looked inside the borders of the city of Bogotá and it only went up to 1990.

In relation to the whole region, and the recent urban developments, the research project “Tendencias recientes de Ocupacion territorial en Bogotá y la región” (CEDE 2000) is an important contribution to the understanding of the process of transformation, especially of the areas outside Bogotá, which was the focus of that study. An important observation of this study is the identification of two conurbations in the municipalities of the first ring (bordering Bogotá on the other side of the river). Municipalities in the north conurbation are being occupied mainly by housing for high incomes earners and other large functions like schools, social clubs and restaurants. This development takes the form of circuits where large rural blocks are densified and occupied with varied functions but the main road structure connecting with the surroundings is still that of the large block, called circuit. In the west conurbation, where low incomes and social housing are located, the development takes the form of ‘racimo’ (branch) where new urbanizations hang from one lineal connection to the existing fabric of the town. The research from the CEDE characterized also the occupation of the rural areas, differentiating between patterns and new functions. At the end, the study offers a characterization of the whole region in different areas according to the pattern of occupation and function. This categorization for the first time covers the whole region showing how the region, considered by many as mainly rural, was occupied by different functions due to the influence of the city.

Recently, with the creation of masters in urbanism, planning and urban design in the large universities in Bogotá, there has been an increasing production of studies in the transformations of Bogotá. However, they mostly concentrate in Bogotá without looking at areas of the neighbour municipalities or at the region from the morphological viewpoint. Within these studies, there are important master theses by Arteaga (1996), and Cortes (2006) about the five municipalities annexed in 1954. Arteaga includes in her study maps reconstructing the transformation and urbanization of areas in these municipalities, with a considerable level of detail. Rincón and Cortés have studied further the idea of the Bogotá region with the Sabana not only in spatial and formal terms but also in administrative and political ones.

7.2.2 Randstad: over mapped and analyzed

The list of studies in urban form of the Randstad is very long. Not without reason a specifically Dutch approach to urban morphology was already explained in chapter 3. The Randstad is one of the areas that many of these studies of urban form concentrate on. Within this extensive list of studies, it is possible to identify different approaches.

In the first place, there is a large interest in reconstructing the historical transformation of towns. Atlases and specific collections of historical maps have been collected and produced for many of the towns of the Randstad. Within this group we also encounter specific analyses developed in order to study the morphological development of specific open spaces or representative buildings in centres of cities or towns.

Secondly, specific studies on the main cities of the Randstad are numerous. Some examples are for Rotterdam, the study by Palmboom (1987), for Amsterdam by de Hoog (2005) and Van der Hoeven and Louwe (1985) and for The Hague the study of Schmitt (2004). These studies enhance the specific characteristics of each of

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35 Project initiated by the Mayor of Bogotá in 1990, which commissioned studies about the actual state and future of the city in all fields.

36 Instituto Javeriano de Vivienda y Urbanismo, An institute for Housing and Urbanism from the Faculty of Architecture of the Universidad Javeriana in Bogotá.
In Bogotá: Traditional centre, The city of neighbourhoods, The city of the infrastructure plan, Urban facilities and other uses, Progressive branched urbanism, Progressive expansive urbanism, Big operations, Urban circuit, Condominium, Parcelling. In the region: Suburban circuit, metropolitan circuit, condominium, parcelling, local specialized corridor, metropolitan corridor, junctions of corridors, rural mixed housing bunch, agro-industry rural bunch, large metropolitan occupations, large productive occupations, protected areas, urban centres and empty areas.
the cities which are given by their specific location and ground configuration. Furthermore, the studies show how each of these cities is the product of the combination of different systems, influenced by different logics like the landscape, the traffic network, the built elements and the water structure. The studies abstract in different layers the different systems and logics, explaining how the actual state of those cities is the product of the combination of those layers.

Another important group of studies of already a consolidated tradition are those dealing with the Dutch landscape. This group has mapped reconstructions of the structure, transformation and process of cultivation of the poldered Dutch landscape, which is very typical in the Randstad area. The studies show how the structure of the ground has a large influence on the urbanization that appears later on in an area, showing how the urban structure links to that of the ground. More about these studies can be found in 4.5.3 in the section about urban form studies in the landscape.

Recently, there has been within the Dutch context a large production of atlases of various regions. As already explained in chapter three, these atlases not only map formal and spatial characteristics but they attempt to include as much information as possible in order to characterize that specific region. Within these attempts, the project of ‘Mapping Randstad-Holland’ which developed within the department of Architecture of the TU Delft (Engel 2004) is important for this study. This project attempts to reconstruct in great detail the spatial transformation of the Randstad. Within that frame, they have identified different periods in relation to the types of urban development and quantified them.

Finally, at the scale of the whole of the Netherlands, the work of Must37 is very important. For the Dutch Pavilion of the Architecture Biennale in Venice 2004 under the title ‘Hybrid Landscapes’ they developed maps of the transformation of the Netherlands, not only of urban occupation but also of different functions, and quantified this information (Kamer 2004). Another important map, also initially developed by Must, and the NIROV38, is the ‘Nieuwe Kaart’ of the Netherlands, where the new projects are mapped. The vision of the whole region with all the new planned interventions is a new viewpoint that the map permits. It gives then an idea of how locally or individually planned projects, when collected together will alter the actual image of the Randstad and in this case of the whole country. What makes this work important is the level of detail of the maps and the fact that it is done for the whole country. It also shows how important it is to develop a good legend and it is an example of how to communicate information when playing with colours, lines, symbols, etc.

37 Must is an urban design and research office based in Amsterdam. www.must.nl last visited 9-03-2009
38 NIROV, Netherlands Institute for Planning and Housing www.ruimtemonitor.nl last retrieved 9-03-2009
Figure 95. Images from Hybrid Landscapes, Dutch pavilion Venice Bienale 2004 (NAI, MUST).

Figure 96. Extracts from Ruimte Monitor (RPB). www.ruimtemonitor.nl

Figure 97. Examples from De Nieuwe kaart (De Nieuwe Kaart van Nederland, Nirov, Den Haag).

Figure 98. Images from Atlas Randstad Holland (Engel 2005).
7.3. Mapping methodology

This section describes the methodology applied in the mapping of the cases. The main observation in this respect, in relation to the comparative nature of the case studies, is that all information had to be homogenised for both studied regions. Similarly, the same procedures were consequently applied to both regions in a process in which they were mapped simultaneously or switching between them continuously.

It also develops around methodological issues like the sources of the maps, the mapping procedures and the scales used through the mapping process. In general, a cartographical base is produced for both cases to be afterwards manipulated with different techniques which attempt to extract the essential formal and spatial characteristics of the mapped areas inside each case. Finally, schemes of a more abstract level are produced.

7.3.1 Mapping Process:

The first stage in the mapping process was the compilation and homogenization of cartographic information for both cases. The next section will deal with the sources used for this purpose. Maps at the scale of the whole region were compiled to enable the general comparison between the two cases at the level of their regional form, road network and natural elements. Afterwards, more detailed cartographic information was compiled and homogenized for the two cross-sections. Section 7.4.3 contains the explanation of the cross-section strategy to study urban regions.

Cross-sections
For each of the studied cross-sections, a basic map containing the street and road network, buildings and natural elements (including main mountain systems and water network) was created as the basis for posterior maps. The study of this basis, with the consultation of current and historical aerial photographs and visits to sites when necessary, guided the identification of homogeneous areas. This process followed various stages of refinement of the areas until a final set and a final map containing the different areas in colours for the two cross-sections was drawn. Section 7.4.4 will explain the background for this step. A general observation for both regions during the identification of homogeneous areas was the emergence of areas that could not be classified in the same way as the others since they were characterized not by homogeneity but by the opposite.

Homogeneous areas
After areas were defined, each area was studied in its internal logic. Since they were homogeneous, the repetitive patterns and elements in relation to streets, built and open spaces were indentified and mapped. After having a common cartographic base for each area, the mapping in this process was adapted in order to highlight the main characteristics of each area. Some cases used details of blocks or of parcels or some aerial photographs as their basis. This was also influenced by the fact that in some areas, digital detailed maps did not exist.

The main spatial and formal characteristics of each area were abstracted in a comparative table for each region and later for both regions together. That abstraction was done by developing schemes of the process of formation of each area, of the street pattern and of the typical blocks.

Layers
After the study of each area independently, the understanding of its internal logic and its relation to neighbouring areas and to the region was realized by the study of areas as layers. Each homogeneous area and its different repetitions across the region formed a layer. For each layer, the logic of formation could be described through maps.

The way to study the region as a whole was through the study of the relation between the layers. The areas with non-homogeneity were defined as in-between areas. The region was then explained in its form as the combination between layers and in-between areas.

Cross-regional comparison
Finally, the mapping activity realized for both regions following the same process allowed a comparison between the findings of each region. This comparison was then at a more abstract level achieved through the schemes. Processes of formation and transformation, street patterns, types of relations between the elements (street, building, open space) could be compared between the two regions. Similarly, types of relations between the layers and the in-between areas were compared.

Conclusions at different levels
From this process conclusions at different levels were derived. Initially, conclusions about patterns and in-between areas for each area emerged separately. Consequently, conclusions about layers and regional form for each area were taken in mind, to finally derive conclusions at the level of comparison between the two analyzed urban regions. These final observations by comparing the two regions were abstracted in relation to the conclusions from the other chapters in order to derive at the general conclusions of the research.
7.3.2 Sources and maps

One of the problems of developing comparative research between two different contexts has to do with the source and character of the compared information for the different contexts. In this case there was indeed big differences between the maps encountered for both cases. Because of this, a large amount of the necessary work for the mapping of the cases concentrated on the collection of information and its homogenization for the purpose of comparison. This implies transformation of the original sources and homogenization of scales and legends. Because the objective of the case studies was to uncover the formal logic of the studied regions, a base map was needed. That base map should contain buildings, streets, open spaces and main natural elements. The map should also have the necessary level of detail to include dispersed urbanization outside compact centres which sometimes, in maps at regional scales, is abstracted as either compact or open.

The main sources to construct the basis of the maps of the cross-sections were as follows:

- The source for the Randstad base was the topographical map, from 1995 in digital version at scale 1:25.000. In some cases, the recent developments, especially from Vinex neighbourhoods did not appear in the map. In those cases the author actualized the base by digitalization of the topographical map and aerial photographs of 2005.

- The main source for the base map of the Bogotá-Sabana region was the one developed by the research "Tendencias recientes de ocupación territorial en Bogotá y la región" (CEDE 1998). This research generated a common cartographic base in digital version for the whole region that was not available before. It is common for most of Bogotá’s map documents to represent only the area inside its border. Similarly, the documents of the different municipalities of the Sabana do not include Bogotá in their maps; they only map inside their own municipal borders. At the regional scale, maps of the whole department of Cundinamarca and of regional models remain at a much more aggregated scale and therefore are not useful for the objectives of this research. However, the source used by the research of the CEDE, namely from DANE\textsuperscript{40} 1993, was outdated in relation to the recent urbanization in the border areas from the past decade. For that reason, the base from the CEDE’s research was actualized by the author using as source aerial photographs from 2005.

Additional to the base map of the actual state for the cross-sections, a historical sequence of maps at the same scale (1:25000) was constructed. In the Randstad, historical topographical maps at that scale were available. In Bogotá, the historical maps produced by the research by CEDE were at a too aggregated scale. They needed to be completed with more detailed information for the area of the cross-sections. Other historical maps were mostly from the viewpoint of Bogotá. Consequently, they only showed the areas developed at each moment in relation to Bogotá, leaving the area of the periphery unmapped. The historical sequence for the cross-section of the Bogotá region was created by the author using aerial photographs.

Because the main objective of the cases was to study, through mapping, recent transformations, initially two decades were selected: 1950s and 1970s. This first set was selected on bases of regional maps. The observation of the regional maps showed that after 1950 there was the rapid urbanization in both contexts. However, after detailed studies of some areas, for example in some areas of the borders of Bogotá, it was observed that between 1970s and today, there was a large area developed. Because of this, the process of urbanization was not identifiable from the sequence. Consequently, two periods were added, one in the 1980s and in 1998 since aerial photographs of that period were available. As a complement, in order to understand the transformation as a process, and to identify repetitions, an early period was included, around 1900. According to the available information, this was 1910 for Bogotá and the Sabana, and 1911 for the Randstad.
7.3.3 Cross-sections: strategy to map urban regions

Why cross-sections?
The way of limiting the study area deserved a careful attention. Generally, a problem when studying urban form in the contemporary city lies in how to limit or define a boundary of the study area. Nowadays, in spatial terms it is difficult to trace lines differentiating what is urban, what countryside, or what are other types of in-between areas. It is thus difficult to define the specific borders of a city or of an urban region. The concept of borders and limits becomes blurrier every time since different types of borders (administrative, political, functional, and spatial) do not coincide. In functional terms, regions interact and overlap with other regions making it even more difficult to delimit them. Furthermore, in some cases those regions are not administratively defined like is the case in the Randstad and the Bogotá-Sabana region.

In spatial terms, the area of the plateau, clearly defined by the bordering mountain belt, could delimit the region of Bogotá-Sabana. However, one could also talk about linear developments that go outside the plateau along the main regional connection routes as far as other municipalities in the lowlands; or about the whole department of Cundinamarca as one region, as the ‘Mesa de Planificacion’ has done41. From other viewpoints, the Bogotá-Sabana region interacts with a very large region and even with the national scale because of its important position as capital and because of the amount of functions and services that it contains.

The case of the Randstad is even more complex in terms of a possible spatial delimitation, or bordering of the region. In the first place, at a higher scale it can be part of a continuous urbanized area called the Blue Banana42, or the North-western urban agglomeration of Europe. Indeed, when mapping the Randstad in terms of urban occupation and different functions, it is impossible to identify a clear border for it. Towards the south it keeps extending itself in connections and urban expansions to other regions like Brabant and the same happens to the east around Utrecht. If we go further we can connect it to the Antwerp and Flanders urban agglomeration and going east the same could be done with the Ruhr area in Germany.

As a form of tackling this problem, the definition of arbitrary but equivalent limits for the two regions seems like a good option. For this reason, cross-sections along the regions are selected as a strategy to study representative samples of the diversity of types of occupation and functions in urban regions, without having to say much about the totality or the lines where a specific region ends. In order to say something about recent urban form, it is necessary to look at the whole spectre of the urbanization of the territory, including the rural, open areas and the in-between spaces where the new functions characteristic of recent urbanization are located. By defining sections across the territory, it is possible to cover different types of urban occupation and different densities, from the compact, historical centres, to the open areas. This allows observing that even open areas or areas with rural functions are all embedded in or influenced by the urban activity and that they all constitute essential parts of the contemporary city.

Some references on limiting study areas
The strategy of sections is not new. It was already used by Basilico and Boeri in their “Italy: Cross Sections of a Country” where six sections of the Italian landscape of 50 Km length and 12 Km width were presented. “The sections were cut from the centre of some large conurbations and orientated towards the periphery of the town, following a principle route. Six sequences of 150 images showed a territory that had been overrun by a wave of similar and solitary manufactured objects, from which emerge urban environments with a completely new form invisible to an aggregate, synoptic viewpoint” (Basilico and Boeri 1998).

Other examples of delimiting areas with specific dimensions in order to compare different urban formal and spatial configuration are the studies by Southworth and Owens (1993) on suburban residential neighbourhoods in the San Francisco bay area, delimiting and comparing squares of 100 acres (around 0,4 km2). In the same way, Hess et al (1999) define circles of 0,8 kilometre radius and compare 12 different sites of urban and suburban areas in the U.S. Finally, for cases of urban regions and dispersed urbanization in Europe, the studies of different regions compiled in the manifestation New territories and dispersed urbanization in Europe, the studies of different regions compiled in the manifestation New territories and dispersed urbanization in Europe, serve the interest goes beyond those typical samples of the diversity of types of occupation and functions in urban regions, without having to say much about the totality or the lines where a specific region ends. In order to say something about recent urban form, it is necessary to look at the whole spectre of the urbanization of the territory, including the rural, open areas and the in-between spaces where the new functions characteristic of recent urbanization are located. By defining sections across the territory, it is possible to cover different types of urban occupation and different densities, from the compact, historical centres, to the open areas. This allows observing that even open areas or areas with rural functions are all embedded in or influenced by the urban activity and that they all constitute essential parts of the contemporary city.

In the cases of squares and circles of specific dimensions, they attempt to take a typical section of a specific urban pattern and compare different typical patterns. In this research the interest goes beyond those typical samples of the diversity of types of occupation and functions in urban regions, without having to say much about the totality or the lines where a specific region ends. In order to say something about recent urban form, it is necessary to look at the whole spectre of the urbanization of the territory, including the rural, open areas and the in-between spaces where the new functions characteristic of recent urbanization are located. By defining sections across the territory, it is possible to cover different types of urban occupation and different densities, from the compact, historical centres, to the open areas. This allows observing that even open areas or areas with rural functions are all embedded in or influenced by the urban activity and that they all constitute essential parts of the contemporary city.

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41 See at the beginning of this chapter the description of the planning mechanisms in the region of Bogotá-Sabana for an explanation of what the Mesa de Planificacion is.

42 The term ‘blue banana’ refers to the banana-shaped metropolitan axis running from London over the Benelux and the Rhine area to Milan. “This axis, usually called the “Blue Banana”, has often been identified as the area that traditionally has shown the greatest development potential in Europe’s geo-economy”. Hosapers, G.-J. (2003). “Beyond the Blue Banana? Structural Change in Europe’s Geo-Economy.” Intereconomics: Review of European Economic Policy 38 (2): 76-85.
Images from the manifestation New Territories

<table>
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<tr>
<th>Street Patterns</th>
<th>Gridline (c. 1900)</th>
<th>Fragmented Parallel (c. 1900)</th>
<th>Waved Parallel (c. 1950)</th>
<th>Loops and Lollipops (c. 1970)</th>
<th>Lollipops of a Stick (c. 1980)</th>
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</table>

Figure 100. Images from Southworth and Owens (1991) Hundred acre squares as study areas

Images from Basilico and Boeri (1998) with the sections of 50 km per 12km across the Italian territory

Figure 101.
Figure 102. Crosssections with details. Above: Bogotá-Sabana, under: Randstad
7.3.4 The selection of the cross-sections

Based on the previous studies of urban form for both regions presented previously in this chapter, sections of 7 km wide, crossing each region, were defined. The sections cover a variety of different morphological areas, uses, and densities, based on existent studies for the two regions. In this way, the inclusion of a broad spectrum of different types of occupation and densities is ensured. Even if some of these areas show in their current situation a very dense and compact urbanization pattern, when observing the historical development of the sections, we can see how, for both cases, they were mostly rural areas with small towns at the beginning of the twentieth century. In that sense, we can see how the sections cover areas that were in different periods of rural use, areas of periphery or border areas. A comparison of these areas and the moments they are urbanized can contribute to the investigation of how processes repeat in the way elements locate in the territory in urbanized areas in different periods and within different contexts.

In the case of the Randstad, the section runs west-east from The Hague’s centre through the green heart to the city of Utrecht. This selection includes city expansions of various periods in the nineteenth and twentieth century, Vinex locations, office areas, industrial areas and rural areas with small towns in the green heart. In the case of Bogotá, the section runs south-north from the urbanization in slope on the south border of Bogotá, crossing the city and the rural land with small towns of the Sabana. In the south the section includes the developments of the south border of the city and in the north, the rural area includes the centres of small towns, suburban housing developments around these towns and peri-urban functions in the areas closer to Bogotá border and along the main roads.

7.3.5 Homogeneous areas

The two cross-sections are a sample of different urban forms of occupation and densities. From the observation of the relation between the main elements that are the basis of any morphological study, street system, buildings, open space and plots, in different periods of time, patterns are identified. Patterns are different configurations and types of combinations of the indicated elements. Each pattern defines a different homogeneous area.

The homogeneous areas coincide with what Conzen defined as the ‘plan units’, “an individualized combination of streets, plots and buildings” (Conzen 1960) that make the “composite town plan” (Moudon 1994). These homogeneous areas also refer to a typology of tissues, where urban tissue is “an organic whole whose form can be described at distinct levels of resolution” (Kropf 1995). The different areas are then the result of the identification of different patterns not only from the observation of the current condition but also in their evolution and transformation.

Not only the consolidated approaches like the British and the French to urban morphology define plan units of tissues. The idea of ‘homogeneous areas’ is central to the approach utilized by in Delft. Studies in that context also define different areas based on the identification of different patterns, periods of development and types of development. After the definition of these areas, the studies go normally deep into the logic of each of the areas. This is done by identifying the main elements and the forms of organization and relation between them and the repetition in these forms.

The definition of homogeneous areas and their identification in the ground plan allows for organizing the study of urban form into the two cross-sections. It gives a direction to the mapping activity that in this case starts by mapping each area independently and then going on to study the region, as it will be explained in the following section.

7.3.6 Scales

As explained in the introduction to the comparison, the aim of mapping is to look at the relation between specific areas in the studied regions and the regional structure. Because of this, with the cross-sections as departure point, the mapping develops at two different scales, the scale of the homogeneous areas, and the regional scale. However, in this research, these scales are approached in a specific way. Inside each scale variations are studied. Likewise, the relation between the two scales is of great importance. The most important observation in relation to the two scales is the direction of the study, from the smaller scale (homogeneous area) towards the regional one.
Scale of homogeneous areas:
In this scale, each identified homogeneous area is studied separately in its internal logic. The aim is to understand the logic of organization of the different elements: streets, buildings and open spaces and parcels. For this purpose, each area is studied in its historical transformation, in order to be able to abstract the process how each area is formed and how it transforms in relation to the indicated elements.

Regional scale, relations between areas
Most of the times, urban morphology studies typical configurations and typical elements of an urban area; for example, the studies mentioned from the North American suburbia look at specific sections where typical configurations are studied and compared against others. Other studies separate each of the areas, looking at their inner logic. This is done in this research with the first scale, which is of the homogeneous areas inside. However, the idea of studying each of the areas separately misses the possibility to understand each area as part of a network, connected or disconnected from others. In this research, the idea of studying areas goes further than understanding their internal logic. It aims at looking at the way those areas interact and form the region.

The regional scale is observed through the study of the interaction of homogeneous areas. It concentrates on the types of relations, or lack of them, between different homogenous areas. Each homogeneous area is related to similar ones in the region because they share the same formal configuration and process of transformation in relation to the regional infrastructure. Consequently, layers can be formed by separating the region based on the types of areas.

This process indicates a direction where we go from the study of the scale of the homogeneous area back to the scale of the region. The region is then investigated as a composition of different overlapping layers. The idea of overlapping layers at the regional scale emerges from the mapping review in Part 2 that shows how areas can be understand as overlapping layers. Furthermore, places in which conflicts occur due to the collision of layers can be identified.
Figure 105. Different patterns in the Milan region (Boeri, Lanzani, Marini 1993)

Figure 106. Plan Units for Alnwick (Conzen 1960)
Chapter 8. Atlas

In this chapter, the most important maps developed for the two case studies, of the Randstad and the Bogotá-Sabana regions, are shown. It is an atlas because it is mostly a collection of maps developed by the author accompanied by explanatory texts. The maps included here show a progression from the study of homogeneous areas and the study of the elements and processes of organization of those elements in each area towards more abstract schemes summarizing the main characteristics of each area. These abstract schemes also allow developing a comparative matrix between the areas.

After the maps of the areas and the conclusive matrixes for both studied contexts, maps of the different layers generated by the combination of the areas are included. Besides the layers, this chapter also contains maps of the areas of conflict between them, in-between areas, at a more detailed scale.

Finally, the conclusions derived from the mapping of each studied urban region separately are correlated in order to compare the two regions to each other. This comparison generates the conclusions of the case studies. In the following chapter, these conclusions of the mapping exercise in two urban regions will be generalized and critically observed leading to the conclusion of the thesis.
8. 1. Mapping the cross-sections: Homogeneous areas

As explained in chapter 7, the first strategy towards the mapping of urban form in the cross-sections, extracted as conclusions from the review of mappings developed in part 2, was to identify homogeneous areas. Different types of patterns define different areas in a spectrum which goes from configurations that have different types of grids to the modernist freestanding bars and the large industrial conglomerations, including open areas dedicated mainly to agriculture and leisure activities. The figures show the different homogeneous areas identified for the whole cross-section in both cases (Randstad and Bogotá region). Each homogeneous area is a specific combination of different types of patterns and functions. The maps illustrate the defined homogeneous areas. In the following section, each of the type of area will be described more in depth.

Due to the dimension of the cross-section, in order to illustrate each of the areas, a detail of each section was extracted as an example. These details cover border areas between dense and open areas for both regions. The first detail in the Randstad runs from The Hague into the greenheart with its agriculture activity and the small urban centres, until the town Zoetermeer, a typical example of the expansion of the sixties, product of the spatial planning policy of the time. The detail in Bogotá includes the north urban borders of different periods and the centre of Suba, a small town annexed to Bogotá in 1954, which is nowadays just another neighbourhood of the city, ending in the north with the agricultural areas of the Sabana de Bogotá that have recently suffered rapid transformation because of the location of city functions. The maps of the cross-sections show where the selected detail is located.

The following sections present the different types of areas identified with descriptive text and examples extracted from the detailed area for both cross-sections. Each area is illustrated with maps highlighting the specificities of that area in terms of patterns and processes of transformation. The maps aim to stress the important elements structuring the area.

Because the types of maps included for each area are different since they aim at highlighting its specificities, at the beginning of the section, together with the maps of the detail, all areas of the Bogotá –Sabana region as well as for the Randstad are shown at the same scale and with the same level of detail.

Each area is given a representative name, which summarizes the main formal aspect of its configuration and transformation. Afterwards, each area is described with the aid of examples extracted from the detail in the cross-sections on the bases of the following points.
a. street pattern and the relation to parcels, buildings and open spaces
This summarizes the main morphological characteristics of each area. It describes how parcels, building and open spaces are organized in relation to the street system and what types of pattern they form.

b. organization of functions
Even if the functions on each area were not documented in detail, it is important to see if areas are mono-functional, if they are exclusively residential or used for other types of function, or if they combine different functions and in which way.

c. types of origin and transformation
This describes the area’s origin, development and transformation in relation to the existent city and road system at the moment of development.

d. forms of connection to the rest and/or borders (if existent)
This describes the way the area is connected to the rest, the types and number of connections, or specific morphological features of those connections. It also describes any borders between these areas and neighbouring ones and their types.

Figure 108. Homogeneous areas Bogotá-Sabana cross-section
8. 2. Analysis example areas, Bogotá’s cross-section

The following pages contain the examples from the different types of patterns encountered in the Bogotá-Sabana cross-section. In the first place, maps with the location of the selected detail in the regional map and the location of the different homogenous areas are included. Afterwards, samples of each of the areas are included at the same scale, before giving a detailed analysis of each area. In this section maps and texts should be read simultaneously because they complement and explain each other. The texts for each area follow all of them, as the same structure described in the previous section,

a. street pattern and the relation to parcels,

b. buildings and open spaces organization of functions.

c. types of transformation and origin.

d. forms of connection to the rest and/or borders (if existent) with neighbouring areas.

Figure 109. Historical development detail
Figure 110. Detail Bogotá-Sabana with homogeneous areas

1. Colonial centres
2. Gridded entities by jumps
3. Rectangular grid
4. Composition of blocks in stamps
5. Minimal progressively filled grid from illegal origin
6. Minimal progressively filled planned grid
7. Progressively saturated branch
8. Linear in slope with dispersed derivations
9. Ensembles
10. Extra minimal grid in ensembles
11. City inside city
12. Large industrial linear developments
13. Large peri-urban blocks
14. Urbanized rural circuits
15. Rural extra large blocks
16. Rural branches
17. Large open areas
Figure 111. Sample patterns for each homogeneous area
8.2.1 Colonial centres

a. These are the original towns founded by the Spanish in the colonial grid and the contiguous extensions following the same pattern. In the maps we can see the foundational centres of two of the municipalities annexed to Bogotá in 1954 (Suba and Engativa) and to Cota from the first ring outside the river. The planned grid has been mainly transformed inside the blocks. At first, the blocks were divided into four large parcels with buildings in the corners. These were consecutively subdivided and built up. Initially, the centre of the block remains open but later it is also built up leaving smaller patios which are spread out in the block as the only open spaces. The open block in the centre is the main square.

b. Mixed functions correspondent to a centre of a town: administrative, services and commerce mixed with housing.

c. Originally planned and designed but not in regards to its densification. In the analyzed examples we see two different cases. While Suba was surrounded by large residential areas and it became just another neighbourhood in Bogotá, maintaining its central character and functions, the foundational centre of Engativa remained isolated by the airport and it is still on the border of the city. In this case, we see how the blocks in the centre of Engativa have not experienced the same densification as Suba and many functions typical of border areas like bus parking and car services are located here.

d. These foundational centres were initially located at a specific distance to the centre of Bogotá along the regional connection roads between Bogotá and other cities. Nowadays the main regional connection routes do not cross the centres due to the small dimension of the streets in these areas and the increase traffic.
8.2.2 **Gridded entities by jumps**

a. These developments correspond to what has been called the city of residential neighbourhoods (Cortés and Salazar 1992; D.A.P.D. 2003). These areas developed around the decade of the 1960s, separated from the consolidated city at the time, with one lineal connection to the centre. These are developments in a grid pattern of comparable dimension to the colonial Spanish grid. Their pattern follows the same grid which existed in central areas at that time. Moreover, the way how the parcel is built, initially in the borders, to be filled up later is almost entirely similar to that of the colonial grid. Open spaces in the neighbourhood are blocks that are left open.

b. Residential mixed.

c. Planned in one intervention: These areas are incorporated as one complete neighbourhood into the city.

d. All the neighbourhoods from this type developed discontinuous to the existent city and to other similar developments leaving areas in-between still occupied with rural functions. They developed initially in the form of a jump connected to a local existent road. With the growth of the city, the open areas between the city and these neighbourhoods were built up. Nowadays, there are multiple connections between grid pattern of this area and patterns of neighbouring areas in the places where ending streets of different patterns coincide.
Areas developed connected by one line to the existing city but discontinuous to developments at the time. With time, the open areas are urbanized to produce a continuous gridded extension.
8.2.3 Rectangular grid

a. In these areas the grid is no longer square as in the foundational grid and its dimensions are defined by the parcel division. We could say that this type of rectangular grid is the first standardization of the colonial one. While the square colonial grid of 100 meters generates a lot of leftover space in the middle, the rectangular allows distributing the parcels along the long sides of the block. These areas correspond to an extensive urbanization that came to fill up the open areas left between the developments by jumps of the previous areas facilitated by the hierarchy given to the street network by the Plan vial (Road plan). At the parcel level, it is initially built up along the streets with an open space in the back, but with time it is almost completely built up.

b. Mixed residential with small workshops and shops in the ground floor.

c. Development is progressive by neighbourhoods.

d. These areas also initially developed discontinuous from the existent city and connected by one line. The open areas in-between were later filled up by similar types of rectangular grid developments.
The rectangular grid fills up voids left by previous developments.

Rectangular blocks to distribute parcels in two lines. In some cases with parcels also along the short side. In later developments the parcels along the short side are eliminated.
8.2.4 Composition of blocks in stamps

a. These areas are of a gridded pattern composed into a larger system which becomes a sort of super-grid enclosing smaller compositions of blocks, open spaces, local streets and pedestrians streets repeated as stamps. The blocks are composed of row houses, built in one intervention as middle and low income neighbourhoods. Parcels have a front and back garden.

b. Mixed residential with small workshops and shops in the ground floor.

c. Planed and designed as a neighbourhood expansion. Occupation of the plots by building and transformation of the house progressively.

d. Initially connected at one point to the existent city, the development of the areas around makes these areas better connected with their surroundings. However, the grid pattern is not continuous to that of the neighbouring areas and in that sense, the streets of higher hierarchy, or avenues inside each neighbourhood, are the connection to the neighbours.
These neighbourhoods are formed by repetitive stamps. Each stamp is a composition of main streets, blocks, pedestrian streets, parking and green areas.

In these neighbourhoods there is a composition of main streets, blocks, pedestrian streets, parking and green areas but without the repetitive character of the stamps.
8.2.5 Minimal progressively filled grid from illegal origin

a. These neighbourhoods are based on a grid pattern subdivided to optimize the use of the land. Blocks and parcels have minimal dimensions. A parcel measures between 5 and 6 meter wide and 10 to 12 meters long. Blocks are formed by two lines of parcels with their backs to each other, having therefore a width between 20 and 24 meters. Their length varies depending on the borders the block encounters. It can be very long up to 300 meters or very short of around 56 meters but in the maps we can see that 100 meters is a common dimension. Blocks and parcels are progressively built up to a point where almost no open space other than the street is left.

b. Mixed residential with small workshops and shops in the ground floor.

c. These areas are the product of a rational subdivision that is developed progressively. The grid extends infinitely until the natural borders of the city, filling up all available land. The neighbourhoods composing these areas are all from illegal origins, legalized only at the end of the 1990s. Inside the blocks, parcels develop discontinuous from each other until the point that the whole block is built as can be seen in the sequence of aerial photographs.

d. There is a relative continuity with the surrounding street system, when the grids of neighbouring areas coincide, or at the points where they coincide. These types of developments fill up all available land until the border of Bogotá with the river.
process
1. minimal grid laid down
2. progressive infilling of plots
3. densification by occupation of plots

Three different locations in areas with the same pattern shows the process of densification of the parcels.
8.2.6 Minimal progressively filled planned grid

a. Similar to the preceding type of area (8.2.5), in these neighbourhoods the division of blocks and parcels tries to optimize the use of the land. Dimensions of blocks and parcels correspond to those mentioned for the previous area. However, they differ in the organization of the blocks. In this case, open spaces are designed as part of the neighbourhoods by leaving empty blocks, or by leaving open lineal elements between sets of blocks. These become parks for the areas. The streets are organized with a hierarchy where the main streets enclose groups of less wide or sometimes pedestrian streets.

b. Mixed residential with small workshops and shops in the ground floor.

c. These areas are not of illegal origins and that can be observed in the presence of collective open space. They follow the guidelines from the study of minimal norms (“urbanizacion de normas minimas”) (Instituto de Credito Territorial, Departamento Administrativo de Planeacion Distrital et al. 1972). This study was developed in order to guarantee a minimal condition of habitability for the developments of progressive character. In Bogotá, the 'Decretos' (laws) of 1973 legalized the application of this study. The study regulated the minimal dimension of the housing unit and of the access and pedestrian streets. It also required a minimal amount of collective open space. The basic urban elements for the neighbourhood were progressively developed by the state while the housing unit was constructed by the user. The house could be built up progressively starting from a small unit.

d. There is a main road bordering the neighbourhoods of this type of areas. This border road connects to the grids of neighbouring areas but the street pattern inside the area and that of the neighbours do not correspond.
Progressively saturated branch

a. The simple principle in the pattern follows the idea of a branch, where progressive derivations appear from the main connection road and successively new derivations from those sub derivations emerge. At the same time, internal roads enclose areas forming circuits that are afterwards subdivided into the block system we can observe today. Because of this, there is no homogeneity in the dimension and form of blocks or parcels. The area is almost totally built up. The few open areas are either empty plots in process of urbanization or areas not available to urbanization (wetlands). The few sports fields present belong to schools.

b. Mixed residential with small workshops and shops in the ground floor.

c. Areas of this type developed in a natural way, progressively from a basic lineal connection into an almost entirely built-up area today. The transformation is in general at the level of the individual parcel, by subdivision and construction. All neighbourhoods composing this area are of illegal origins. The areas in the shown example were legalized in the 1960s and 1970s and the ones in border areas between 1993 and 1996.

d. The connection with the surroundings is initially lineal, and in the process of densification it connects in more points. However, because these areas are always located near the borders of the city, natural borders limit connections.

In the border blocks we see still an ongoing process of densification by occupation parcel by parcel. In these areas we find that often empty plots are used for parking of buses due to the peripheral location at the end of bus routes.
process 1: derivation from main connection route / 2: closeness of circuits / 3: internal division into minimal blocks / 4: empty areas filled with autonomous urbanization

scheme showing how more local streets derive from existent connections defining irregular blocks, creating many discontinuities in the street pattern

blocks are defined by the trace of streets and by subdivision process rather than by a previous plan
8.2.8 Linear in slope with dispersed derivations

a. The hillside determines a type of pattern where particular separated interventions develop in relation to one lineal connection crossing the hill. These interventions are disconnected from each other. The only connecting element between them is the main access line. Each of the separate intervention that connects to that line has homogeneity internally in the pattern and block and parcel distribution, but not in the area as a whole. Most blocks are either very large, or they are not even closed by streets on all sides. Along the bordering streets and the derivations inside the blocks, dispersed buildings of varied types and dimensions are located.

b. Mono-functional entities. Between the different interventions, we find a diversity of types, from neighbourhoods with free standing houses in the form of gated communities to large buildings for non residential functions like offices, schools and recreation.

c. Individual interventions.

d. Connection to surroundings is lineal in limited points. The same topography acts as borders because of slopes that cannot be urbanized or that do not allow connection. Each separate intervention connects to the others by the main line while it is separated from the others by open space.
Process of development:
Separated interventions connected to a main connection road without generating a continuous pattern

Different types of developments connect to the main connection: single house neighbourhood, public facility, private club, office complex, residential building, informal housing
8.2.9 Ensembles

a. These areas do not show a homogenous pattern in the block and street system. Their common characteristics are the relations between street, block and building. First, they are composed of large blocks. In some cases these blocks are not even closed but they are formed by one lineal connection where streets penetrate into parking alleys. The ensemble is disconnected from the surroundings not only by the pattern and configuration of the streets but also by physical elements like fences with only a few entrances. Most of the times these entrances are guarded, forming gated communities. Second, in these large blocks, buildings are freestanding, not necessarily aligned to the streets defining the block. The large amount of open space not occupied by the buildings is collective. That space becomes parking areas, sport fields and green areas for the inhabitants of the whole complex. Third, the buildings are multifamily units.

There are two types of ensembles depending on the size and type of intervention. In one type we found large interventions where configurations of buildings, open spaces and parking repeat as stamps to form the whole area. These are complete neighbourhoods planned and designed; in most of the cases they are for social housing or low incomes. The plan of the neighbourhood incorporates a system of large blocks where residential towers or slabs combine with parking and open spaces for recreation. There is also normally a central area or axis where commercial and other activities can locate.

The other type is posterior and it includes large blocks, and closed ensembles of a smaller scale. They are small scale ensembles with one or two large blocks maximum, commonly called “conjuntos” (ensembles). It corresponds to a development independent from the surroundings which most of the times is enclosed by fences to these surroundings.

b. Residential with commercial areas for the neighbourhood.

c. Planned and designed as an intervention.

d. These areas connect to the surrounding fabric by existent infrastructure, most of the times of a local scale, but they are disconnected in relation to their neighbouring areas. The streets surrounding the large blocks connect to existent roads, forming a sort of super-grid that connects internally to the buildings and parking areas inside the large blocks. Because of the size of the blocks they create a discontinuity with the surrounding street pattern composed of a smaller block system.
The period of development of this type of ensembles starting in the 1980s coincides with the plans (Acuerdo 6 and 7) which leave the development of housing to private developers.
8.2.10 Extra minimal grid in ensembles

a. The most recent developments (1990s) in empty plots, mainly in border areas of Bogotá, develop in the form of small ensembles. These ensembles contain repetition of blocks of minimal dimensions, with a width between 14 and 18 meters and a variable length, which form a system with pedestrian streets and parking alleys. These blocks are even smaller than those of illegal origins in the areas in 8.2.5. These are legal developments in the form of slabs that together form ensembles developed in one intervention. These developments have two systems of different scales. The extra-minimal grid is connected to the existent street network by blocks of a larger scale that surround the whole development creating a large block formed of smaller units.

b. Residential.

c. These developments appear both discontinuous from the existent fabric and filling up empty areas between already developed neighbourhoods. When discontinuous, they hang from one connection per ensemble in one intervention.

d. A single connection to the existent city is the base for the development of a whole area. These types of development are currently appearing at the borders of the built-up area and the countryside or in areas left open between built-up areas and natural borders.
8.2.11 City inside the city

a. These areas were developed as one large intervention with the motto city inside the city which means that they should provide all the services for its inhabitants. This motto acquires high relevance if we think that most of the areas developed in the same period (1980s to 2000) were in the form of ensembles (8.2.9) which only provided housing without facilities and public space for the inhabitants, neither is it fitting for the city.

The design of the plan is based on building blocks with local public spaces for the housing of the block. The buildings are located in the perimeter of the blocks in order to define that public space and the space of the street. However, in the design of each of the blocks there are similar characteristics with those of the ensembles described before, due to the surrounding fence for each of the blocks creating discontinuity at pedestrian level and threatening the character of the street. This becomes a lineal space enclosed by buildings but bordered by fences.

b. The area combines housing with other functions that complement and serve the housing. These other functions are commerce, at local scale and a shopping mall and religious, educational and health facilities, together with sport fields and recreation areas.

c. These types of areas, complete pieces of city are the product of a previous plan that contemplates all scales from the connection to the existent city to the design of the urban blocks and the basic principles for the architecture. It is developed progressively in the following order: first, the street network and the public space are developed and afterwards the different blocks are developed progressively.

d. The design contemplates a structure of blocks that will connect to the city scale road infrastructure.
8.2.12 Large industrial linear developments

a. These areas are composed of large blocks mostly in their totality filled up with large buildings corresponding to warehouses and small industry. They develop in the form of large buildings, with the only open space designated for parking and access roads. These types of development appear initially lineally along important roads like the example two and progressively become an area like in the example one where its location is dictated by the vicinity to the airport. In the second example, the road becomes a regional connection posterior to the existent neighbourhoods and these types of blocks and buildings overlap the existent pattern. In the land along the same road that remains open, we see how from a lineal development, subdivisions appear to become an area like in the first example.

b. Industrial functions and warehouses for storage and commerce.

c. Progressive along city scale connection and with subsequent derivations that eventually conform large blocks.

d. These developments are connected to a main road of the city and regional scale. In one of the examples included, we observe an area of this type of developments; while in the other example, they appear lineal along a regional connection. These areas become a border between the residential neighbourhoods around them and the regional or city scale road along which they locate.
8.2.13 Large peri-urban blocks

a. The main characteristic of these areas is that they have no clearly recognizable repetitive street pattern. The pre-existent rural road structure defines large blocks. Posterior interventions overlap with these large blocks, with other types of patterns. The basic characteristic of the area in different periods is of being leftover between surrounding developments. In that sense, it could be compared to a fringe belt in Conzenean terms. Initially, a discontinuous urban pattern derives from the main structure to connect to new interventions inside the large block, product of individual interventions that occurred in different areas producing a combination of functions and types. The main structure remains the pre-existing rural structure of the large blocks, since the posterior structure for the new developments lacks continuity. The different developments connect to the main structure of the large block but not to the rest. Finally, in the most recent stage, a final lineal intervention of a diagonal road on the scale of the city as connection to the centre of Bogotá, breaks the area diagonally.

b. Patchwork mixed urban-rural. Functions in this area combine rural activity and glasshouses with schools, small factories, hospitals, large offices and housing in the form of ensembles like those described previously. The initially rural character and agricultural functions are slowly occupied by peri-urban functions like small industries, glasshouses, schools, private clubs and hospitals. Afterwards, small housing ensembles of the type described in 8.2.10 overlap existing functions. Finally, when the main arterial road overlaps on top of the existent structure, new functions like shopping malls appear along the line. These functions come to combine with the existing ones forming an area in current transformation and accommodation to the new city scale connection crossing it.

c. Progressive with a late plan overlapped on top of the unplanned.

d. The area connects locally to neighbouring areas and to the rest of the city through the main lineal connection from which initially the area developed and which later overlapped the city scale connection. Posterior developments at a city and regional scale road infrastructure have broken the continuity of the area, limiting the connection between two sides of the road to one point. In general these areas develop on borders of the existent city, in the case of Bogotá, or of the municipal centre in other municipalities, many times between the consolidated urban developments and natural borders.
Different colors represent the different logic coming together inside the large blocks.

The agricultural land reduced by urban functions occupying initially the border of the large blocks and slowly by internal derivations the inner areas of the block.

The highlighted areas are new functions replacing agriculture in each period. The last two periods show the new transport system and the city scale road network overlapping the large blocks pattern reminder of the rural roads.

The agricultural land reduced by urban functions occupying initially the border of the large blocks and slowly by internal derivations the inner areas of the block.

This sequence shows the way new city scale roads overlap non built areas.
8.2.14 Urbanized rural circuits

a. Areas around the colonial centres of rural municipalities, especially in the borders with Bogotá, like the earlier example of Cota, undergo a process of densification and subdivision where a pattern of large circuits is created. These circuits are further subdivided to form smaller circuits or interior roads which are disconnected from the rest. Buildings are dispersed along the circuits or the internal subdivisions.

b. Rural and urban functions mix in these areas: agriculture, housing, commerce and small industry are present contiguous to each other in the different circuits. The housing is of different types. We find farm houses in the middle of large plots next to single family row-houses.

c. Mainly repeated individual transformations, progressive through subdivision of larger parcels that generate new connections inside the circuit, and eventually smaller circuits. Densification also through subdivision without a repetition pattern.

d. There is one connection to the rest of the region which remains since the origin and during the transformation of the areas. Natural elements limit this type of development and contribute to the circuits being closed.
More internal derivations and densification in circuits. A bypass is built to deviate traffic from the colonial center, creating circuits also in the side of the river.

Internal derivations inside the circuits.
8.2.15 Rural extra large blocks

a. These are subdivisions of extra-large blocks connected to existent rural roads. The rural street pattern of extra large (planned) blocks remains and in some cases has been subdivided. The occupation is dispersed all over the blocks, with internal smaller roads connecting to buildings.

b. Agricultural land which is slowly occupied by glass-houses and functions of the city which demand large amounts of area, mainly schools and clubs.

c. Traces of extra large blocks planned initially for rural functions, slowly subdivided and built up.

d. Only connection to the surroundings by the pre-existent rural road network.
8.2.16 Rural branches

a. These mainly rural areas follow a pattern of small local roads in derivation from more important ones that eventually close, to form a large circuit. However, the main pattern is one of branches subdividing from one initial connection. Dispersed buildings locate along or at the end of derivations of the different branches.

b. Mixed functions with agriculture as background: the mainly agricultural activity is fast being replaced by agro-industry (glasshouses) or peri-urban functions like schools or clubs. Along the higher scale connection roads in the area there is a larger concentration of road service functions like restaurants and retail areas for the rural activity and for the car.

c. Progressive transformation.

d. Local rural roads connect to the regional road system.

Transformation, fragmentation and diminishing of rural agricultural areas due to occupation by urban functions.
8.2.17 Large open areas

The last group contains large open areas. In this case, there is not a description in terms of the formulated four themes defined for the other areas since a repetitive pattern cannot be identified in these areas. They are special events in the region that condition the pattern in their surroundings. In these cases, a small explanation is included together with maps of the development and logic of these open areas. Still, the most important is the way they relate to built areas in their vicinity.

**Mountain chain, natural reserve**
This area is the first mountain line between Bogotá and the Sabana. It is still largely conserved as natural reserve. Small pedestrian paths give access to the foot of the mountain, they often begin from rural roads.

**Wetlands, urban reserve**
This area is the reserve of wetlands. It is nowadays protected and in process of rehabilitation. It constitutes an offer of passive recreation for the whole city. At a local scale, a lot of illegal housing developments are located in these areas which officially are not allowed for urbanization due to the risk of flood. The recent interventions began controlling the urbanization process in wetlands, converting these areas in green belts which are bordering urbanized ones.

**Airport: large occupation, function at national scale**
The area of the airport constitutes the largest occupation of the city against its west border with the river. It is urbanely occupied on three sides and it becomes a very large barrier to the continuity of patterns completely disconnecting the two areas on both sides.

**Large private open spaces, clubs**
These are open areas with a private use. The clubs offer recreation for members only. They constitute a break in the continuity of the urban pattern.
8. 3. Comparative observations within the Bogotá-Sabana section

The characteristics of each of the areas described and illustrated through maps in the previous section can be compared at different levels in order to observe transformations in urban form in relation to different time periods and specific conditions of those periods. Similarly, the evolution of different types and patterns can be traced.

The summary matrix in the following pages abstracts and compares the different patterns and types of areas identified for the studied section in Bogotá’s region. The matrix contains three different levels of resolution. The first row summarizes the process of formation and transformation of each area. The second row deals with the street pattern of the area inside, and finally, the block and its internal logic in relation to the pattern of building and parcel forms the third row. For each, summary schemes are included, abstracting the main characteristics of the common elements between the studied examples.

In the matrix, the patterns are all presented at the same scale except the patterns located after the vertical black division with the label: ‘Scale change x2’. Patterns located after this marker are mainly from rural areas and therefore in order to put them together with the urban patterns they were reduced to half. The same applies for the blocks. They are all drawn at the same scale, doubled in size to the patterns.

The comparison and subsequent abstraction developed through the matrix allows indentifying sequences of stories of transformations. These sequences can be identified at different levels: at the level of the street pattern, at the level of the building block and at the level of the process of development and transformation of an area in relation to the existent city at that moment. These stories will be developed in the sections following the matrix. They will be illustrated with the correspondent details from the matrix and examples.
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PROGRESSIVE OCCUPATION AND DENSIFICATION

SCALE
CHANGE
\[ \times 2 \]

PATTERN

BLOCK BUILDING

NON TRACED - BLOCK FORM IS RESULT

BRANCHED

CIRCUIT
Large peri-urban blocks (8.2.13 p.160)

Urbanized rural circuits (8.2.14 p.162)

Rural extra large blocks (8.2.15 p.164)
8.3.1 Grid patterns against branch patterns: Designed against resulted

The first observation from the summary table is the relation between types of patterns and processes of development. Two types of pattern, the grid and the branch, show how differences in their formal configuration relate to different processes of development that consequently produce different types of blocks.

The gridded patterns are initially designed on the ground. In this case, blocks and parcels are defined previously. Afterwards, parcels are built and densified individually by the individual owners. We observe then, in each of the different identified gridded patterns, homogeneity in block and parcel sizes.

The developments in the branch patterns occur progressively by derivations of local roads connected to the existent ones. The street pattern does not show any repetitive pattern in the form, other than the relation of connection from smaller roads to larger ones successively. This process of connection of local roads eventually creates closed blocks. However, the form of the blocks is not homogeneous since they are the result of the different roads laid down without a preliminary plan. The same holds for the parcels.

It is interesting to observe a similar comparison in the rural patterns. In these patterns, drawn in at a scale half the size of the urban ones, we see open blocks defined by a road but not by built elements. Built elements are dispersed in connection to the local roads. In this case we also observe a gridded pattern against a branched one. The first is planned and traced previously while the second is the product of individual interventions that eventually form closed blocks.

8.3.2 The transformation of the grid

The second observation emerges from comparing the different traced gridded patterns between themselves. The sequence of the maps shows how the colonial grid, based on blocks of approximately 100 by 100 meters, transforms into bars of around 14 meters by 60 containing two rows of single houses turning their backs to each other. The form of production and transformations of these two models is also very different. We will see in the coming paragraphs how this process of transformation occurs as a product of different regulations through time.

First, the colonial grid that can be observed in the centres of Bogotá and the towns of the Sabana follows the directions given by the Spanish for the foundations of new towns in the American colonies. The blocks of around 100 meters per side formed a homogeneous grid. The process of development starts with the tracing of the grid and definition of the blocks and parcels that are progressively occupied by the owners.

These centres grow initially by additions of blocks of the same dimensions in the proximity of the areas already developed. This type of growth was regulated by the Laws of the Indies and by posterior laws like the Acuerdo (Law) 10 of 1902 and 06 of 1914. These laws established the requirement of a construction
license to develop new constructions, based on the process of the development of the city until that moment, by extension of the grid contiguous to the existent one.

The second episode in the transformation of the grid contains developments of gridded fragments of similar dimensions to the colonial grid, but developed discontinuous from the existent city, what we called here 'by jumps'. This type of development differs from the previous one because it locates in relation to connection roads, discontinuous with the existent city and it develops in the form of neighbourhoods. Still, the occupation of the plots is realized most of the times progressively by the owner. In these types of developments the dimensions gradually transform from the 100 meter square to a rectangular because of diminishing of the plot size.

The transformation of a grid formed by squared blocks to one formed by rectangular blocks coincides with the attempt to plan and organize the urbanization by jumps that had occurred in the city of Bogotá. From the 1951 Plan Pilot by Le Corbusier, which was not implemented, to the 1961 Plan Vial by the Planning Department, a street network at the city scale was defined. The aim to define this network was to connect the already dispersed developments and to direct the urbanization to fill up the empty areas left in-between. This planned network combined the grid with a structure of concentric rings towards the periphery of the city. The developments with the type of rectangular grid as shown in the matrix correspond to neighbourhoods developed between the new network of the Plan Vial (1961) filling up the empty areas between previously developed neighbourhoods. These neighbourhoods in rectangular pattern are also provided with open areas for parks and public facilities.

The next stage in the transformation of the grid corresponds to housing neighbourhoods for low incomes. In these areas, the grid is reduced to blocks of 20 to 24 meter width. In this pattern, there are two types of developments, from illegal and legal origins. Those from illegal origins are called ‘barrios piratas’ (pirate neighbourhoods). Pirate neighbourhoods are developed by a developer who subdivides an area and sells the parcels without respect to the regulations and restriction of urbanized areas, and without the required facilities and dimensions of infrastructure. In this case, the size of the block follows purely economical reasons to optimize the land and accommodate as many parcels and blocks in the developed plot as possible. The blocks adapt to topography or natural borders maintaining the same width corresponding to two rows of parcels back to back.

In the case of legal neighbourhoods, the dimensions relate to the ones suggested by the ‘minimal norms study’ (see 8.2.6). What is interesting to observe is that the type of grid and the dimensions of the blocks in both cases are very similar. The difference is that legal neighbourhoods reserve empty blocks for parks and public facilities. Still, because of the flexibility of the ‘minimal norms study’, developments do not carefully consider the connection between the local streets of the neighbourhood and those existent at the moment of development in the neighbouring areas. Most of the times, these neighbourhoods connect to the existent city through existent local roads.
The differences and similarities observed between pirate neighbourhoods and legal ones coincide with those mentioned by other authors (Cortés and Salazar 1993; Tarchópolus and Ceballos 2003) that argue how areas from legal and illegal origins after a time of consolidation show comparable patterns and formal configurations. As Tarchópolus and Ceballos (2003) explain referring to neighbourhoods of illegal origins, ‘…with the time, the growth of the city and the consolidation of its typological process ends up turning them into just one more neighbourhood, even if it still presents incompleteness in relation to street network and public space and facilities; however the rationality that remains in the spatial organization is similar to the neighbourhoods of formal origin.’

The dimensions of the blocks for low income housing, from legal as well as from illegal origins was constant for a long period (1960s and 1970s). Starting from the 1980s new tools of planning in the city generate different types of developments in ensembles (conjuntos). Within these types of developments we find the reduction of the block size to a width between 14 and 18 meters, accommodating two lines of parcels between 7 and 9 meters deep and a width that in some cases has reached the 2.5 meters. These blocks are grouped in closed ensembles and because of this, they become part of a new story about the emergence of a super-grid, related to different process of occupation and regulations. That story is part of the following section.

8.3.3 Super-grid

A different form of pattern from the grid and the branch is constituted by the super-grid. This super-grid is formed by ensembles which are organized in large blocks, breaking the continuity of the surrounding grid. In the studied area we encountered several types and sizes of ensembles but mainly two stand out in relation to the way buildings are distributed in the super-grid. One is filled up by rectangular blocks of row houses while the other contains multifamily buildings of four or more floors. The ensembles can be of all sizes, composed by just one large block or by several of them repeated. Both are in most of the cases enclosed either by fences or by the back of buildings or houses constituting gated communities.

The first, already mentioned at the end of the previous section, corresponds to a closed ensemble grouped in a large block which contains small blocks with the dimensions mentioned before. These blocks are organized along pedestrian streets with one large parking area and one or two entrances to the whole area which is surrounded by a fence or by the backs of the bordering houses. The second type contains buildings in the form of slabs, containing apartments. The main characteristics of the large blocks composing this super-grid are the following.

- There is no relation between the buildings and the form of the block. One large block contains buildings distributed in open space, not aligned to the surrounding streets.
- The open space where buildings are located is private for the residents of the ensemble, containing private recreation and parking areas.
- Each ensemble is developed by a developer which takes care of the urban design and the building of the blocks. The housing is completed before it is handed over to the owner.
- They are most of the times closed by a surrounding fence with one or two controlled accesses to the large block as gated communities. Because of this, they break the gridded pattern of the surroundings.
- The surrounding streets of the large block connect to the city scale network.
- These types of super-grid are used for social housing as well as for expensive housing. The differences between the two rely on the architecture and dimensions of spaces, mainly those of the houses, since the collective open space is also most of the times not very generous for high incomes.

This type of development in ensembles has appeared all over the city of Bogotá and the surrounding municipalities since the 1980s. They are products of a new set of planning mechanisms. In this form of planning the city government takes care of the scale of the city street network, supported by the Plan Vial, while the provision of housing is left to developers that want to take maximum profit of the developed plot. The background of the planning in these years until the ‘Plan de Ordenamiento’ (Ordering Plan) of 2000 was the aim of densifying the city, which is translated into reality in these ensembles and the development of an economical system to support that densification and the provision of housing.

43 ‘…con el tiempo, el crecimiento de la ciudad y la consolidación de su proceso tipológico acaba por convertirlos en un barrio más, aunque sigan presentando deficiencias en términos de vialidad y dotación de espacio público y equipamiento, no obstante la racionalidad que persiste en la organización espacial es similar a la de los barrios de origen normal.’ Tarchópolus, D. and O. L. Ceballos (2003). “Formas de crecimiento urbano en Bogotá: patrones urbanísticos y arquitectónicos en la vivienda dirigida a sectores de bajos ingresos.” Scripta Nova, Revista electrónica de geografía y ciencias sociales VII(146). (author’s translation)
Finally, a particular type of area observed in the Bogotá-Sabana case is that of circuits and the large peri-urban blocks. These are interesting in many ways. In the first place, they show the influence of different planning processes in a same area. Second, these areas still show remains of their rural character and are overall products of independent individual interventions next to each other and without a general plan. Third, the peri-urban blocks, observed in the border of Bogotá, and the circuits, observed in the neighbouring municipality of Kota, show similar characteristics, while the first is almost totally urbanized now and the second one still is in proportion more rural than urban. These two cases, located at different distances from the existent city of Bogotá and from relatively dense areas show similar processes at two different stages. We could affirm that the development of the peri-urban blocks show the possible future of the circuits, if the processes and planning mechanisms continue the way they are now.

These areas, specially the peri-urban blocks show the different types of processes that were described in relation to the evolution of the grid and the super-grid. Initially, these areas are of rural character, with a structure of local rural roads. Because of the vicinity to the city, functions like small industry, schools and clubs and glass-houses locate here. At the same time, spread through the area but in connection to the local rural roads, illegal housing developments appear. The large blocks with those spread functions constitute the image of the first type of transformation, progressive and unplanned.

The second stage corresponds to the laying down of a street network of a higher scale, and then the area is occupied (next to the already existing functions) by a super-grid of closed ensembles of houses and multifamily buildings. The image of the large rural blocks with dispersed constructions changes into one where the blocks are subdivided in ensembles but the main connections remain the initial local rural roads, since those are the only ones with continuity.

Finally, after the POT (Ordering Plan) and the establishing of a new public transport system (Transmilenio), a new diagonal connection cuts the area. Along this connection, lineal developments appear. These developments are large shopping malls and warehouses responding to the logic of a new established regional connection and of a main station of the public transport system. Nevertheless, today the area shows the different types of development of different periods and logics that still lead to discontinuities, relying on the pre-existing rural road structure.
8. 4. Analysis of example areas in the Randstad cross-section

The following pages contain the examples from the different types of patterns encountered in the Randstad cross-section. In the first place, maps show the location of the detail in the regional map and the location of the different areas in the detail. Afterwards, samples of each of the areas are included at the same scale, before giving a detailed analysis of each area. In this section, like the one on Bogotá-Sabana, maps and text should be read simultaneously because they complement and explain each other. The texts for each area follow the same structure described in the previous section:

   a. street pattern and the relation to parcels, buildings and open spaces
   b. organization of functions
   c. type of transformation and origin
   d. form of connection to the rest and/or borders (if existent).

Figure 112. Historical development detail
1. Linear developments
2. Designed ground plan with free standing buildings
3. Designed ground plan with continuous buildings
4. Optimized grid
5. Bars in stamps
6. Coliflower neighbourhoods
7. Super-grid enclosing residential grid pieces
8. Large blocks in balloon connected to highway
9. Gridded islands, semi-open blocks
10. New urban centres
11. Incomplete large border blocks
12. Rural polder pattern
13. Glass-houses conglomerates
14. Large open areas

Figure 113. Detail Randstad with homogeneous areas
Figure 114. Sample patterns for each homogeneous area
8.4.1 Linear developments

a. These developments correspond mostly to the medieval centres of towns. They have a lineal pattern where houses are located along a linear connection. This connection is most of the times related to the system of the landscape, it can be water, a dyke or a road. Today, these lineal medieval towns are still visible in their lineal structure and the type of parcels and houses. Initially the pattern follows the linear connection to later grow into perpendicular streets, which eventually close to form long blocks.

b. Mixed uses. These areas are the original centres of many towns which today are expanded. Because of this, many services and commercial enterprises are located along these lines, mixed with housing.

c. Progressive transformation: Its origin and location is strategic in relation to the linear infrastructure. Growth develops initially along that line and later, when that line is filled, it forms long blocks parallel to the main linear connection.

d. The lineal connection constituted a network with other built areas. Additionally, in some cases a perpendicular line is also a connection to other built areas. In that case, the development follows both lines. At a regional scale these medieval towns form a network still recognizable today in the landscape.
8.4.2 Designed ground plan with free standing buildings

a. These areas are developed as town extensions in the form of housing neighbourhoods with the ideas of the English garden cities in the background. These ideas are brought into the design of these areas in relation to the green character and the form of street and building distribution. The street pattern is designed following natural lines, composing a pattern of diagonal and curved streets. The form of the blocks is then not homogenous, neither their width. Streets are composed with tree lines. Buildings do not form a continuous line surrounding the block but they are either free-standing in the middle of the plot, paired or together in groups.

b. Mainly housing and housing that changes function into offices.

c. Planned and designed in the ground plan, developed progressively. For example, the area of Marlot in the maps, was designed by a commission from The Hague municipality in 1920 to develop a neighbourhood with villas. Most of these types of developments are located originally in areas where the ground is of sand and developed next to the dunes along the coast.

d. There is continuity with the surrounding areas connected by pre-existent roads which acquire relevance within the new plans. However, in the recent example included in the maps, a free-standing neighbourhood of villas in the new Vinex of Ypenburg, the continuity existent in the historically similar patterns with the surrounding does not occur. In this example connection to the surroundings occurs at limited points. This limited connection and the disposition of the blocks creates a green buffer between this development and the neighbouring ones. Surrounding street pattern belonging to a regional scale constitutes a border that appears posterior to the original development of the area, limiting the connection to only the main street.
8.4.3 Designed ground plan with continuous buildings

a. These areas correspond to the first designed extension plans for the main cities in the Netherlands. The plans are in the line of the City Beautiful movement, based on a design with diagonals and public spaces as important elements in the plan.

b. Residential mixed. Separating, functions are concentrated in the main axes of the plan while the rest is mainly housing.

c. Designed in one plan, developed progressively by municipality and housing corporations. Afterwards, some of these areas have experienced urban renewal but in most of the ones observed in the cross-section, block structure and street pattern were kept.

d. The hierarchical design of the ground plan includes the design of the connection to the existent city at the moment of the plan. Because of their design as extensions of the existent city at the beginning of the twentieth century, these areas are connected through the main streets and diagonals to the centre of the towns they are expansions of. Later interventions mainly in relation to infrastructure have created borders in some of these areas. For example, in the maps we see how train infrastructure creates a border on one of the sides of the example.
8.4.4 Optimized grid

a. These extensions, developed around the 1960s, are formed by a grid of rectangular blocks. The width of the block is fixed to fit two lines of regular and repetitive parcels along the block. Within this basic rectangular grid, we observe different types of blocks. The types differ in the ending of the block. Some blocks have in the short side also a row of houses or a small flat in the form of a slab. Another difference is that the block can contain row houses or apartment flats. In the case of apartment flats, the character of the inner open space changes from private inner gardens to public or communal space, showing a new stage where the character of the block is even more open since there is no private open space. However, one common characteristic is the open character of the block where there is not anymore a perimeter of buildings in the block. Instead, the block is defined by bars on the long sides, sometimes complemented on the short side. In both cases, the corners is not considered specially or different from the rest of the block.

b. Mainly residential.

c. Planned as extensions of existent cities and towns, developed progressively by blocks or flats.

d. In their development these areas connect to the existent city through existent connections. Not in all the cases they develop continuous to the existent fabric, but sometimes they leave undeveloped areas in-between. Today there is continuity between the grid-pattern of these areas and neighbouring ones.
8.4.5 Bars in stamps

a. These are areas developed in the post-war period following principles of the Modern Movement. In the pattern, there is no correspondence between the order of the streets, the buildings and the open space. Streets do not constitute closed blocks, the buildings are bars standing in public open space and buildings do not configure blocks either. We can identify four different layers constituting this area. These layers do not coincide.

The first layer is that of the open space, differentiated between the open space in which buildings are standing free and the main open space at the scale of the whole complex where recreation and non residential functions are located in special buildings.

On top of this layer we find the local streets that connect to the buildings but do not necessarily form closed blocks.

The next layer is formed by the buildings that are free-standing bars. They are organized in group compositions. In the pattern of blocks and buildings we can identify repetitions. We can find compositions of groups of buildings, streets and open space that repeat as stamps. The composition also appears in the height of the bars in the form of compositions of high flats and low ones.

Finally, on top of all the other layers we find the higher scale street system. This is a system of streets for the whole area, to which the local streets connect. It connects the area with the existent surroundings.

b. Mainly residential with specific areas for commerce, recreation and communal facilities.

c. Planned and developed in an intervention by phases.

d. The higher scale street system is the connection to the surroundings. At the same time, the scale of this system creates disconnections at local scale with streets that do not make a continuous grid but are all ending in one of a higher scale. Similarly, the large public open spaces that bind these areas from inside, and where in some cases streets end, can constitute a border in the continuity of the street pattern of neighbouring areas.
8.4.6 Cauliflower neighbourhoods

a. These areas are developed mainly in the decade of the 1970s. They are commonly called ‘cauliflower urbanism’ because of their ground plan. The street pattern is very characteristically based on one line of connection to the rest of the city from which derivations appear. These derivations are cul-de-sacs, or closed streets ending most of the times in alleys with parking and housing organized around them. Houses are facing the internal streets and alleys. This distribution of the houses creates a front and a back of the neighbourhood. The front is defined by the streets and spaces where the accesses to houses are located. The back is constituted by the open space in the back part of the houses.

b. Mainly residential.

c. Planned and developed in an intervention.

d. The relation to the surroundings is limited to the main axis from which the rest of the streets are derived. This creates disconnection between the different parts that are dependant on the main connection. It also creates closed alleys with only one access. In general, the pattern is of discontinuous alleys. At the scale of the neighbourhood, the composition of streets and the access of the housing in relation to these streets create a sort of buffer zone between the surrounding. This buffer zone is constituted by green areas located in the back of the houses which break the car connections between the different alleys.

Buildings give their back to the green space in the border of the blocks
Buildings give their back to the green space in the border of the blocks. Alleys or internal space of the block to which buildings have their accesses.
8.4.7 Super-grid enclosing residential grid pieces

a. These areas are the most recent large extensions in the study area, developed during the 1990s after the Fourth spatial planning document extra, Vinex. In some cases, we find areas developed with a similar pattern at the end of the 1980s. They are designed with a hierarchical street pattern. In the first place, there is a connection to the highway system. From that connection, a system of streets of an intermediate scale between the highway and the local streets of each neighbourhood appears. This system of streets constitutes what we call here the super-grid. In the images it is possible to see how this super-grid encloses sub-areas of comparable dimensions. The streets of this super-grid are of a considerable width because they are coupled with linear green and water elements. The connections between the sub-areas are limited to that super-grid.

Inside each sub-area, a grid pattern of blocks with two lines of houses or buildings is the most common pattern. Each sub-area also contains small-scale open spaces.

b. Residential with a local centre providing commerce and services for the area.

c. Planned and designed in an intervention, developed progressively by sub-areas.

d. The area connects in limited points to the highway system and to neighbouring areas. Because of this, at the same time that the highway system connects rapidly these areas to the whole Randstad, it creates disconnection with neighbouring areas.
Green buffer against highway

Limited accesses to highway and crossing points at local scale

The super-grid contains fragments of grid and it is the intermediate connection towards the highway and the limited connections to neighbouring areas

Inside that large grid, a smaller grid pattern appears. However it appears as discontinuous pieces of grid

Lines of green streets with water and parking enclose smaller units in a sort of supergrid.
8.4.8 Large blocks in balloon connected to highway

a. These areas also correspond to recent extensions as in the previous section but they contain business, small industry and warehouses. They are distributed in large blocks where large building masses are built on a background of open space.

b. Offices, storages and small industry.

c. Planned and developed in an intervention.

d. Connected to the highway system by limited points but the highway simultaneously constitutes a border with neighbouring areas. But the highway simultaneously constitutes a border with neighbouring areas.
8.4.9 Gridded islands, semi-open blocks

a. These areas show a development similar to the cauliflower neighbourhoods (8.5.7) in the way they connect in limited points to a street system in the perimeter. However, these areas are developed later than those of the cauliflower pattern, and therefore there is not only one linear connection from which alleys are derived in the manner of cul-de-sacs, but a non-homogeneous grid configuration. This interior grid contains blocks of varied dimensions and forms, and it is delimited partially (not on all sides) by bordering buildings. Blocks form an irregular grid are composed using curves and semicircles and around open spaces like small neighbourhood parks. Blocks are open in the sense that inside, behind the private gardens, they contain a public open space accessible from the street.

b. Residential mixed.

c. Planned and designed, developed progressively.

d. There are connections in limited points to the surroundings. Moreover, open areas and water create natural borders between the different gridded islands and between them and the surroundings.
8.4.10 New urban centres

a. These areas correspond to new centres for existent towns of recent development (in the examples: new centre of Voorburg developed in the 1950s, Leidschenhage shopping mall in the late 1960s and Zoetermeer Nieuwe Centrum in the 1980s). These new centres are organized in large blocks with detached buildings of a certain height. In the case of Zoetermeer’s centre, it is also connected directly with the train system which defines its central character.

b. Mainly services, offices, administrative functions and commerce.

c. Planned and developed at once.

d. The large blocks containing the new centre connect or are bordered by main streets that connect to the rest of the urban area they are the centre of, and to neighbouring ones. However, the dimension of the large blocks can act as border for the surrounding residential pattern.
8.4.11 Incomplete large border blocks

a. These areas do not show a recognizable homogeneous pattern. They can be characterized by their location, between borders of different types. In the examples we see borders created by large scale infrastructure and municipal limits. This character of border makes these areas predisposed for the location of functions which require large surfaces or large open space, for example functions related to leisure. These areas are leftover in-between large scale infrastructure. Because these infrastructure lines can only be crossed in limited places, they become borders, affecting the connectivity of these areas to the rest of the fabric and generating an in-between state. Their pattern forms large blocks defined by the varied surrounding patterns that sometimes penetrate the large blocks, but without continuity. However, these blocks are never closed in all their sides due to that large scale infrastructure connection.

b. Because of their location, they contain non-residential functions like leisure related and large scale shopping and storage. Functions like golf courses, recreational parks, communal gardens and sport fields are located here. The main characteristic of these areas is that they are an amalgam of different functions coexisting next to each other.

c. Progressive by individual interventions without unitary plan.

d. In most of the cases these areas are organized along local roads and between this local network and the highway or train network. These types of areas are located between more dense and central areas constituting a sort of border between those. On the other hand, the infrastructure in these areas constitutes a border that defines its type of development and its disconnection at least on one side with the neighbouring areas.
An area of similar characteristics historically. The location at administrative borders explains the development of open space being a binding element. Over time, the diminishing of rural land, replacement by leisure functions, also open. Increasing scale of the highway connection shows a patchwork. Parcel division in detail.
8.4.12 Rural polder pattern

a. This is the area dedicated to farming. The main structuring element in these areas is not the built but the open space. The areas are structured by linear connections coinciding with the main water system. Along them, buildings are dispersely aligned. To these main lines, derivations connect which give access to buildings located outside this main line.

b. Exploitation of the ground (agriculture, cattle farming, small industries).

c. Progressive, planned transformation by densification (more or bigger buildings) or by aggregation of parcels into bigger ones due to increasing scale in the production system.

d. The system of local roads and the water networks structure these rural areas forming a network that successively connects these open areas to more dense ones. To this pre-existing system of water and connection roads, posterior scales have overlapped like the highway system, breaking in some cases the continuity of the pre-existent system.
Urban occupation diminishing agricultural land
8.4.13 Glass-houses conglomerates

a. These areas, previously open and rural, have now a high concentration of glasshouses on a very large part of the land. The proportion between open and built changes and they are actually mainly built areas where most of the plot is filled by the glass-houses with open space only in the lines of connection and water collection ponds.

b. Agglomerations of glasshouses.

c. Planned transformation.

d. These conglomerates of glass-houses connect to the rural polder road system.
8.4.14 Large open areas

a. These areas are occupied by one non-residential function. In the examples extracted from the section we see large parks at a city or regional scale. The main characteristic is to be a large, mainly open, surface.

b. Recreation or other non-residential, large impact functions like airports, large campuses, military bases etc.

c. Planned and designed in an intervention.

d. The street system bordering these large and mainly open areas connects them to the neighbouring urban areas. Most of the times, they are also well connected to the regional road system. These large open areas interrupt the small scale road system when they are surrounded by dense urban areas. In other cases, like in the examples of large parks in the town of Zoetermeer, they are marking the end of the dense area and the transition to the open countryside.

8.5. Comparative observations Randstad section

The different areas studied in the previous section come together in a comparative and conclusive matrix. In the same way as in the Bogotá-Sabana case, the matrix contains three different levels in relation to three scales of resolution. The first row summarizes the process of formation and transformation of each area. The second row deals with the street pattern of the area inside, and finally, the block and its internal logic in relation to the pattern of building and parcel forms the third row. For each, summary schemes are included, abstracting the main characteristics of the common elements between the studied examples.

In the matrix, the patterns are all presented at the same scale except the patterns located after the vertical black division with the label: ‘Scale change x2’. Patterns located after this marker are mainly from rural areas and therefore in order to put them together with the urban patterns they were reduced to half. The same applies for the blocks. They are all drawn at the same scale, doubled in size to the patterns. As it was done for the Bogotá case, schemes illustrate the main characteristics of the common elements between the studied examples.

In the Randstad matrix we see the emergence and separation of new scales of connection dealing with the increasing size of the cities and the emergence of a regional network. While scales of connection are separated, the block, and the relation between the built and open space are also transformed. These different stories of transformation will be discussed in the following subsections.
Linear developments
(8.4.1 p.181)

Designed ground plan with free standing buildings
(8.4.2 p.182)

Designed ground plan with continuous buildings
(8.4.3 p.184)

PROGRESSIVE OCCUPATION AND DENSIFICATION

EXTENSION PLANS

LINEAL

COMPOSED GRID

NON DESIGNED - BLOCK FORM IS RESULT

DESIGNED

CLOSED BLOCK
**PATTERN BLOCK-BUILDING PROCESS**

- **Linear developments** (8.4.1 p.181)
- **Designed ground plan with free standing buildings** (8.4.2 p.182)
- **Designed ground plan with continuous buildings** (8.4.3 p.184)
- **Optimized grid** (8.4.4 p.185)
- **Bars in stamps** (8.4.5 p.186)

**EXTENSION PLANS**

- **Optimized grid**
- **Repetitive stamps**
- **Semi-open block**
- **Disappearance of closed block**
Bars in stamps (8.4.5 p.186)

Cauliflower neighbourhoods (8.4.6 p.188)
Gridded islands, semi-open blocks
(8.4.9 p.194)

Bars in stamps
(8.4.5 p.186)

Cauliflower, lower neighbourhoods
(8.4.6 p.188)

Gridded islands, semi-open blocks
(8.4.9 p.194)

Composed grid

Branched

Disappearance of closed block

Disappearance of scales
Super-grid enclosing residential grid pieces
(8.4.7 p.190)

Super-grid enclosing residential grid pieces
(8.4.7 p.190)
<table>
<thead>
<tr>
<th>Large blocks in balloon connected to highway (8.4.8 p.192)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural polder pattern (8.4.12 p.198)</td>
</tr>
</tbody>
</table>

**LINEAL**

- Super-grid enclosing residential grid pieces
- Large blocks in balloon connected to highway
- Rural polder pattern

**SEPARATION OF SCALES**

- PUNCTUAL CONNECTION - LINEAL
- Filled large block
- Semi-open block

**EXTENSION NEIGHBOURHOODS**

- Designed super grid
- Composed grid

**PATTERN BLOCK-BUILDING PROCESS**
The sequence of patterns schematized in the matrix shows the gradual separation of different scales in the street network. Simultaneously, it shows the transformation of the building block and its openness in relation to the street network and to the distribution of buildings and open spaces. It also shows the separation between the connecting element, street or road, and the buildings in relation to it. At a larger scale, it shows the separation between fragments of built areas. These fragments depend each time more on the connection at a higher scale, the highway network. This first section deals with the separation of connection scales.

Already in the first column of the matrix, in the linear pattern, two different hierarchies of streets are clear: the main axis and secondary ones. The axis is the connection with neighbouring towns which directs the urban growth, while the secondary streets allow for later developments when the line of the main street is filled. Similarly, the rural pattern in the last column of the table shows how rural circuits and rural branches, that emerged from the polder structure, have a clear differentiation of hierarchy in the roads based on the structure of the landscape and water.

Columns two and three contain developments in the pattern called ‘drawn grid’, where influences of the Garden City, picturesque and baroque elements show also a differentiation of main and secondary streets. In column two we see, in relation to its model in the background, a type of garden city with curved streets, alleys and permeable blocks with one or two family houses aligned to them. Following the ideas of the Garden City we can identify in this pattern main avenues which in the case of the example come from pre-existing roads.

The third column schematizes the pattern of the ‘drawn city’ with diagonals, symmetry and closed blocks, typical of extension plans of Dutch cities in the beginning of the twentieth century. In this case, we also see a differentiation of hierarchy in the street system. The principal streets become monumental axes with different profile and relation to the blocks from the secondary ones. The main axes constitute also the connection to the surrounding fabric. Still, in the patterns of the drawn grid, the relation between the main axes with the built element is direct. Along these main streets, buildings align, enclosing the space of the street. The following stage in this story separates the built element from the direction of the street.

When abstracting the patterns of developments under the ideas of modernism in columns five and six, we see the separation of the street for the car from the pedestrian flow and the building as freestanding in the open space of a large block. In this case the pattern is formed by overlapping and not coinciding layers. The form and spatial distribution of the street network does not correspond with the placement of the buildings, the pattern of the pedestrian streets and system of open green space. We see then a super-grid which encloses a repetition of buildings in bars.
and whose function is connectivity for the car. The continuity in the pattern is given by this super-grid, but at the local scale the continuity must then be assumed by the open space and the pedestrian network. In 1977 Castex, Depaule and Panerai brought us through a journey across the disappearance of the essential element of the city of the XIX century: the closed building block, ‘the agony of a specific spatial organization: the urban bock’ (Panerai, Castex et al. 1997). The sequence of patterns and their related blocks shown in the summary table for the Randstad case points to the same.

The same super-grid becomes clearer in the next pattern in the matrix, which also coincides with the chronological development in time: the branched pattern of the cauliflower developments. What we see here is a pattern in form of tree branches connected to this super-grid but disconnected from each other. Connections within the lower scale system (the tree) are limited to the higher scale, the super-grid.

The previous paragraphs described the emergence of a super-grid, at a higher scale than that of the block. This supergrid is initially coupled with the modernist idea of separating the traffic from the rest of the activities in the neighbourhoods. In the developments until the 1970s, corresponding to columns 5 to 8, we see clearly how the super-grid and the different relation that the building has to it, contribute to the disappearance of the closed block. The development of the 1970s, in columns 7 and 8, because of its pattern in the form of branches around alleys, does not organize in closed blocks either. This type of pattern and the distribution of the buildings create large blocks constituted mainly by open space of the backyards of the houses that are themselves oriented towards the alleys. Again, as in the modernist development in the previous periods, we observe an undefined open space that cannot constitute a closed block.

From this point, we see the following columns, also coinciding with chronological developments posterior to the cauliflower, showing two separate systems and two scales, one local and one intermediate, connecting to the rest of the city. In column 9 the parts inside are of a gridded pattern but connected to each other in limited points. In this case, the homogeneity and continuity of the gridded areas is broken by creating disconnected fragments of grid.

A similar observation can be derived from the study of the street pattern of the developments of the late 1980s, and the recent Vinex neighbourhoods. In all the studied examples we find a super-grid, enclosing gridded developments. The local grid shows the return to the closed block in contemporary urbanism, yet the overall area is not a continuous pattern. The super-grid is not anymore defined by the buildings as in the smaller grid because it is reinforced by water elements, parking, bicycle paths and green lines which increase the width to the extent that buildings on both sides do not relate anymore. This dimension of the super-grid is given by regulations which define minimal areas for water and parking that in most of the cases are accommodated in the super-grid. Examples of many Vinex
neighbourhoods not only in the study section but across the whole Randstad show this similar configuration. Inside that super-grid, we find compositions of grids in different directions that are all connected with the surrounding belt of the super-grid.

Furthermore, in these areas a pattern at a higher scale starts playing a direct role, the scale of the highway system. The super-grid connects simultaneously to the highway network in limited points. In most of the cases, the main connection of the area with the surrounding areas is the highway with its limited amount of entrances.

8.5.2 Three types of relation to the surrounding urban landscape and the region

What we see in general in the sequence of patterns shown in the previous section is the differentiation of scales in the street system and the separation of these from the local ones, and from the structure of the built and open spaces. This results in three different ways to relate to the urban region.

Initially we identified extension plans continuous to existent rather compact urban areas. These extensions show two different scales in the street pattern, one local and one that connects the extension to the existent city, also constituting the main axis in the new development.

The second group of developments shows a separation between the built component and the main street network. In this case, the continuity between the existent city and the new development is given by the super-grid, a system separated from the building pattern. This super-grid seems to be most of the times located on the backside of the buildings.

Finally, we encounter an urban extension which does not relate necessarily to a specific urban centre in the sense that the continuity and main connection is given by the highway system which is not necessarily leading to one specific existent city; at least not in spatial terms. It still however does so in administrative terms. This same observation applies for the industrial areas in column 11, organized in relation to the highway and connected locally in very limited points.

8.5.3 In between areas

Through the study of the Randstad section, we found again, as in the Bogotá case, areas without a repetitive pattern. These areas emerge because of their location in borders between different homogenous areas and are the results of the influence of the different areas and scales in their surroundings. As mentioned previously, these areas can be seen as equivalent to the fringe belts defined by Conzen in his study of Alnwick. However, they are not necessarily related to a period of economical stagnation when less housing is produced. In the case of the Randstad, the examples show other types of factors influencing the existence of these areas.
In the studied section of the Randstad, several of these areas can be identified. Their dimension varies in relation to the scale of infrastructure surrounding them. Still, they have common spatial and formal characteristics:

- If a pattern or certain type of repetition can be found in these areas, it shows the specific character of patchwork. What repeats is the characteristic of being a collection of different functions, types and densities of occupation.
- They contain mainly a combination of non-residential functions with a line of infrastructure, train or highway, which limits the development in that area and the type of functions that can be located there.
- Different scales of road infrastructure come together in these areas in an unplanned way.
- These areas do not form closed blocks but can be observed as large blocks limited in their different sides by different types and scales of infrastructure.
- In the large blocks that form these areas, the binding element is the open space.
- That open space is mainly dedicated to different types of leisure activities.
- There are always remains of rural linear patterns which overlap with more recent developments.

We will see later how these areas, in the case of the Randstad as well as in the case of Bogotá, appear as essential in the structure of the contemporary urban landscape.

8. 6. Back to the regional scale: how areas interact

The previous sections showed the specific characteristics of areas defined by homogeneity in the street pattern. However, in order to characterize urban morphology in the contemporary urban landscape, for this research the most important question, besides the way in which they are homogeneous, is the way these areas interact to form urban regions together.

Layers

While the map of homogeneous areas in different colours seems like a collection of fragments, when the infrastructure network is overlapped on this image a new picture emerges, one in which specific types of areas connect to similar ones through that infrastructure network. This allows us to look at the areas as parts of different layers that overlap. In this section, the maps show how areas of similar types are structured in layers, when mapped together with the different infrastructure lines. Specific types of areas form networks with similar types. In this way, the different layers show different types of areas that interact or are organized in the territory in similar ways in relation to different scales of infrastructure and their surroundings.

Through the mapping of each area separately, shown at the beginning of this chapter for the two studied regions, principles or organization and location become clear. The identification of these principles is the tool to study the whole region as overlapping layers. While the description of the layers might share elements with that of the areas, the layers focus on the networks that various areas of similar patterns form, and on the principles of those networks. Furthermore, the description of the layers shows the relation between a specific layer and the spatial structure of the whole region.

8.6.1 Layers in the Bogotá-Sabana region

The different areas encountered in the study of the cross-section in the Bogotá-Sabana region can be grouped and localized in ten different layers. The combination of these layers covers the whole region.

1. The first layer is composed of the colonial centres. They developed with the pattern of the foundational grid. The various centres together form a network in which they are all connected through the road infrastructure. This network corresponds in most cases to the one that existed in the colonial times, where paths connected all the centres and Bogotá to the ports in the lowlands towards the see.

2. The second layer forms a ring of gridded developments with square and rectangular grids surrounding the centre of Bogotá. These areas developed at first by jumps. Later, gridded patterns filled the voids left between the developments by jumps. These areas form a layer of neighbourhoods connected by the infrastructure network which is still today the main city connection. They seem nowadays as a continuous extension around the colonial centre of Bogotá with grids of different sizes, divided by the city scale road network.

3. In the third layer, we find the areas of rectangular minimal grid which occupy areas between the borders of the previous layer and the borders of the city of Bogotá. Within these areas, we can differentiate two types. The first type is formed by the pirate neighbourhoods of illegal origins as well as legal urbanizations following minimal norms. We have observed previously that formally they had very comparable grids. The second type is composed of illegal developments in the form of branches. These areas form an irregular grid when they are totally built up. Both types relate in the same way to the road network of the city. They connect to local roads and not directly to the main road system of the city. The same occurs for these types of developments in smaller municipalities which also connect to the local or rural networks, located in the borders of the urbanized areas.
4. In the borders of the third layer and the borders of the urbanized areas nowadays, we find this layer, which is composed of small urbanizations with blocks of minimal conditions. These small urbanizations connect to the city scale road network, while at the local scale they are discontinuous.

5. This layer contains the urbanizations in ensembles. Ensembles are found dispersed over the whole region. Their location principle follows availability of land to urbanize, independent of its relation to the road infrastructure or to the existent city. These dispersed ensembles appear across the whole city of Bogotá and in some of the municipalities of the Sabana. They are more concentrated towards the border of the city than in the central areas and this is explained because of the period of development starting in the 1980s. Their size and scale varies from one block to a large extension of repetitive large blocks.

6. The sixth layer is formed by linear developments along the regional connections. This layer extends across the region in linear form with large buildings located along regional connections. In this layer we also find the industrial zones with large filled blocks in relation to existent roads from the city towards other regions and in relation to the airport.

7. The derivations in the pattern of branches in the hillsides of the surrounding mountain chains as well as internal hills form this layer. We observe different densities of occupation in branched patterns. We can see how the distance to the city of Bogotá defines the degree of dispersion of buildings along these branches. In the municipalities further from Bogotá, we see dispersed houses, many of which are second homes, while in the bordering mountains of Bogotá we see condominiums of single houses in the east hillside, taking advantage of the view of the plain. In the hillside of the Conejera Mountain in Suba we see smaller and more dense housing complexes mixed with other functions all connected to the branched street system.

8. The network of rural local roads of the plain land of the Sabana composes this layer. These are areas dedicated to agricultural and recreational functions in open areas. This is a layer composed of branches crossing the whole Sabana. The regional connections break the continuity of these areas and of the local network. Within these layers we encounter areas specialized in glasshouses, densifying the road network. The historical aerial photographs show how this glasshouses system has been moving from the areas inside the border of Bogotá to areas outside in the Sabana due to the replacement by residential functions.
5. Dispersed ensembles

6. Linear along regional roads

7. Branches in the hillsides

8. Network of local rural roads

9. Large occupations

10. Large open areas:
    main natural elements

In-between areas:
influenced by border river, border
mountain and administrative borders
9. This layer is formed by dispersed large blocks occupied with non-residential functions. They form voids in the city, large functions or large parks which come to the fore among the built system as large open areas interrupting the road pattern. These areas are all connected to main infrastructure network.

10. The last layer is composed of large open areas corresponding to the natural elements delimiting the road infrastructure network. These are very extensive areas from which the larger in this case is the surrounding mountain system of the region.

8.6.2 In between layers

Finally, we find a layer of a very special type. This is a layer formed by the areas that do not show homogeneity in the internal pattern but have in common a structure of large blocks that are reminders of the pre-existent rural road structure. Inside those large blocks, there is an agglomeration of different functions, densities and types of occupation next to each other, sharing the pre-existent road network. At the regional scale, it is possible to recognize how also these areas form a network because they all are located following similar principles in relation to the infrastructure and the existent city. The network of these in-between areas appears in the border between the consolidated city and the rural areas. This is true for Bogotá and its borders against the agriculture land of the Sabana as well as for the borders of the urban centres of small municipalities of the Sabana, as the maps show, specially around the small towns located closer to Bogotá.

8.6.3 Layers in the Randstad

In the Randstad, it is possible to identify ten different layers related to the homogeneous areas described earlier in this chapter. These areas form different systems in the way they connect or relate to similar formal configurations across the whole Randstad. It is interesting to observe how each layer corresponds to a different period in the development of the Randstad, creating different types of networks with neighbouring faraway areas in relation to different scales of the road infrastructure.

1. The first layer is composed of the current historical centre of towns, most of which developed between 1200 and 1600. These towns developed in a linear pattern along a road or a water connection and are all interconnected to each other by the rural network forming a grid that covers the whole Randstad. This grid is related to the system of the landscape.

2. This layer corresponds to expansions of the centres from the first layer. These expansions are most of
5. Expansions next to highway

6. Business and industry areas

7. Leisure areas

8. Large occupations

9. Open areas, rural pattern

10. Agro-industry

In-between areas:
location in relation to highway and borders urbanization
the times developed following an expansion plan which has mainly formal characteristics related to the ideas of the Garden City and City Beautiful movements. These expansion plans were carried out after the Housing act of 1901, approximately between 1901 and the Second World War. The connection of the new expansions to the existent centres is designed with streets of a broader profile. At the regional scale, this layer has the form of rings around the bigger centres of the first layer.

3. After the concentric expansion by plans in the previous layer, the next layer contains expansions developed also by plans that add compete neighbourhoods and parts of cities. These expansions in the form of slabs organized in stamps or in branched developments, typical post-war reconstruction, form a layer constituted by an intermediate super-grid. This super-grid is generated by the separation between the roads for cars, the paths for pedestrians and the buildings at the local scale.

4. Similar to the previous layer, the additions of complete neighbourhoods in the decade of the 1970s also organize in a sort of super-grid that connects these new extensions to the existent city. Due to the particular formal configuration of these neighbourhoods, designed in the form commonly named as cauliflower, their connection to the rest of the existent city is limited to a few points, mainly on the city and regional scale road system. The observation of these areas in the territory shows a layer constituted by a super-grid formed by the roads of connection to which the cauliflowers connect. It shows a sort of super-grid in an intermediate scale between the local scale that corresponds to local streets inside the neighbourhoods and the regional scale that corresponds to the highways and regional roads.

5. This layer incorporates the higher scale of the highway system. These expansions by neighbourhoods correspond with the Vinex neighbourhoods developed mainly from the 1990s until now. These areas are internally structured by a super-grid of similar characteristics to those in the previous two layers. This super-grid of an intermediate scale connects subsequently with limited points to the highway system in most of the cases or to the national roads system instead when the highway system is not present. When observed on the maps of the region, this layer appears as a network of areas connected to the highway system which could be independent of the existent centres; independent in the sense they can interact with distant areas through the nearby highway connection.

6. Comparable to the Vinex neighbourhoods from the previous layer, this layer is composed of the office and warehouse areas developed contemporary to the Vinex. These form sorts of islands connected through the regional and the highway network to their surroundings. These islands are composed of filled blocks. Because of the connection and the functional characteristics of this layer, it appears as a layer in the region, following the logic of the highway system, rather than of the surrounding built areas.

7. This layer appears as spots of open areas dedicated to leisure activities. It overlaps in the region on top of built and non built areas. Most of the times it takes the form of recreational belts around attractive natural elements.

8. This layer is composed of large non residential functions which attract services to locate in their vicinity. Simultaneously, they break the continuity of the road network around them. These functions are for example the airport and the ports.

9. The rural road network is the spine for this layer which contains open areas dedicated to agriculture. It is a layer of open areas with a network of water and local roads to which houses and large buildings, serving the agricultural function, align.

10. Areas of the previous layer which specialize in glasshouses covering sections of the agriculture layer. In these areas the roads system is denser in the form of derivations from the main agriculture road network.

8.6.4 In between layers

The maps show that areas where layers collide become the in-between areas identified in the study of the cross-section. We see examples of areas left in-between by the collision of the highway system with the pre-existent local road network. When these areas are observed together as one layer for the whole region, they form a network. In this network we can read traces of administrative borders which are partly the reason for the in-between state of these areas. In the following section, these areas found for Bogotá as well as for the Randstad will be described in more detail.
8. 7. Higher scale of comparison: Bogotá-Sabana versus Randstad

The direction this research has taken through the case studies, starting with the study of the part (a homogeneous area) and its internal logic, to go afterwards towards the region, has proven productive in identifying repetitive patterns in the morphology of the contemporary urban landscape. Patterns encountered at the level of an area were the guide to find patterns at the level of layers for an urban region. In a similar way, this section brings this search for repetitive patterns to a higher scale by comparing the observations made until now separate for each of the two regions of the case studies.

8.7.1 Three types of development in relation to the totality

The first level of comparison between the two regions has to do with the layers in their relation to the structure of the whole region and their process of development regarding the existent urban areas at the moment of development. At this level, we encounter in both contexts comparable types of development that can be characterised in relation to three different periods of development and urban models at that time. These three types of development differ in their relation to the existent city and the scale of the units added to it.

The first corresponds to urban growth progressively by additions of blocks or parcels and buildings that in the end form new blocks. It occurs continuous and contiguous to the existent urban areas, in some cases along regional connections. The second type of growth occurs by addition of neighbourhoods but still in relation to one centre to which they are extensions. Finally, the last type of growth refers to the highway or regional road system with new developments that, while still belonging administratively to one municipality, do not depend much on the existent urbanized areas but on the regional connection or the highway.

1. Concentric growth related to one centre

Initially, both analyzed regions appear as a network of small urban areas connected by a road network and in the case of the Randstad, also by a water network. The urban growth in the towns of this network occurs contiguous to the existent centre in a concentric or linear way. This is the first period of development in which all towns are in relative balance in relation to size and they grow by aggregation of blocks continuing the same structure of the centre.

2.A. Growth by neighbourhoods related to one centre

The second period shows a different type of development not anymore progressively in small scale additions, but by addition of complete neighbourhoods. This period initiates with the first expansion plans. In the case of the Randstad it occurs in the form of expansions plans produced after the 1901 housing act. These designed plans are contiguous to the existent city from which they are extensions, and they connect in a direct way to its street system. In the case of Bogotá, these types of plans are not realized but can be observed in the Plan of Bogotá Futuro (1917-1923)45.

2.B. Growth by neighbourhoods discontinuous from existent centres

After these plans, we see how developments in the form of neighbourhoods separate from the continuous grid pattern. In the case of Bogotá, this happens literally by developments in the form of neighbourhoods by jumps which connect only in one point to the existent city while leaving holes of open areas in-between. In the case of the Randstad, this occurs because the neighbourhoods developed since the post-war period present (as shown in the maps) a super-grid or intermediate grid which connects new extensions to the existent cities. This super-grid breaks the spatial continuity between the existent centres at the time and the new extensions.

3. Growth following highway connections

Finally, the most recent developments in the Randstad show a logic of location depending on the highway system rather than on the existent urban areas. The spatial continuity between the new developments and existent urban areas is not as relevant as the connection to the regional or highway system. Therefore, the amount of connections to those existent urban areas is even more limited. In Bogotá, this high scale road network and the development in relation to it are very new but they start appearing in relation to the new transport system established in the city. Recent developments along this line obey the logic of the system and connect to the line and its stations rather than to the surrounding fabric. However, these developments are still mainly for non-residential functions. In relation to housing neighbourhoods, the high scale connection system overlaps existent areas.

The way the city and regional scale road network relates to the existent and new developments in the two contexts occurs in opposite directions. The development by neighbourhoods in the Randstad and Bogotá region differs in the way they connect to the existent urban areas. While for the Randstad the maps show that each part is connected by an intermediate grid or by the highway system, they also show that higher scale connections comparable to a highway system are just recently being laid down in Bogotá and the region. Therefore, rather than conditioning new developments, the regional road system is conditioned by existent urban areas and it overlaps them.

This different order of appearance of the elements

45 See Chapter seven for images and explanation of the ‘Bogotá Futuro’ plan and other plans for both regions.
produces different spaces. In the Bogotá case, along these lines we encounter leftovers of blocks that are cut off with the insertion of a new linear element. We see then a contradiction where border areas against the river in Bogotá are in current process of urbanization, per parcel, while at the same time the area is transformed by a larger scale road system planned by the municipality.

8.7.2 Disconnected or connected parts depending on the observation scale

Along the three periods mentioned in the previous section, we can indentify differences in the relations between new developments and the existent urban areas and between new developments and the existent road infrastructure.

In the areas of the Randstad we see a decrease in the amount of connections with the rest of the fabric, while the surface of the parts dependant on that connection increases and the width or thickness of that line also increases. The process of transformation in the Bogotá-Sabana region occurs in the opposite direction. New developments connect to local roads, while city and regional connections for this new development only appear later, overlapping on top of the local pattern. This difference in the transformation process could mean that areas in the Randstad are better connected than those in the Bogotá region. However, this affirmation depends on the scale of observation.

Depending on the observation scale, we can see a change in the dimensions of aggregation units and in the units of transformation. To start with, in the Randstad the three periods mentioned previously show how simultaneous to the improvement in the connections at a higher scale (regional, highway), the amount of connections at the local scale decreases. When the super-grid is incorporated, the local connection is limited to areas that connect through that super-grid to each other. In many cases, like the cauliflower neighbourhoods, the houses turn their backs to this super-grid reinforcing the disconnection between the different areas. These areas appear in the maps like islands surrounded by this super-grid which is reinforced by green and water elements. The regional image created from this spatial organization model is of islands of contained residential activity connected in limited points to each other.

What we see through the study of historical maps and in the recent interventions in the Bogotá case is how both contexts tend towards a comparable situation. They are comparable in the sense that higher scales of connection limit local connections, while facilitating further ones by limiting the connections with the contexts they are crossing. We find a clear sequence from local, intermediate (super-grid) and regional (highway) connections in the Randstad. Furthermore, areas further from the centre are better accessible from the highway and therefore they can work together in a network independent from the municipalities in which they are located. While to a local
multiple connection in Bogotá, a regional one overlaps. From a continuous non hierarchical grid that allows multiple connections in the borders of Bogotá, but that limits its connectivity to the centre of the city at the local scale, to a city scale and regional connection that limits the local one.

Due to the order of appearance of the elements, while higher scale connections develop posterior to the background residential tissue, they count on a limited free space to develop. This implies demolition of areas along the new lines in a new structure opening the compact residential grid. The necessary space for pedestrian bridges and stops has the form of intermissions in the continuous residential tissue. The collision of the existing continuous grid and the new system is very visible in the maps where we see that recently opened avenues through neighbourhoods end against the next housing block or a local street of a housing neighbourhood. Higher scale networks connect or extend into that neighbourhood. In some cases, they extend up to a specific location ending against a block or a local road. This intervention also leaves leftover green spaces along it, incorporated as small parks for the neighbourhoods.

This shows how the process occurs in opposite ways in the two contexts. In Bogotá’s region, the connection of a large scale road networks appears afterwards. Furthermore, the large scale network is planned and constructed afterwards on empty areas left by urbanization, thus adapting to the existent, or in more recent cases by demolishing urbanized areas. In this case the open space is the leftover of the collision of the logic of the large scale street with the local network. In the Randstad, the thick lines of the regional infrastructure and their increasing dimension and decreasing connection to the rest of the fabric are product of plans considering all scales involved in new developments. Consequently, the images of both contexts appear to be opposite. A continuous residential tissue crossed by lines in different directions that cut that tissue, against islands of tissue divided by green belts.

8.7.3 In between areas: common characteristics

In the two regions, the study of the maps shows the existence of what we have called in-between areas. The observations and comparisons of some of these areas in both contexts allow identifying common and divergent characteristics.

These areas show two main conditions related to their in-between character. In the first place, they are located between borders. This border location defines the lack of homogeneity of functions and patterns, as well as the more open character which allows open space to be the binding element in these areas. The borders can be of different types. They can be administrative borders,
delaying the development of these areas with housing and influencing the location of non-residential functions which cannot locate in central areas. Borders can also be generated by elements that break the continuity in the street pattern. In the Randstad, this occurs mainly due to the train and highway lines. In Bogotá, the river or other natural elements act as borders in a similar way as the highway and train in the Randstad.

However, the highway and the rail infrastructure have a second character. At the same time that they act as borders, they connect at higher scales. The second main condition of these in-between areas relates to this connection at higher scale that allows location of specific types of functions there. Existing functions combine with new ones attracted by the short distance to the highway. In this way they show colliding logics and they become the summary of many urban forms at another scale, a combination of various configurations. These blocks form a buffer between already urbanized areas and the new connection network, showing a combination of functions existing previously: agriculture and agro-industry with functions generated by the proximity to the road.

Nevertheless, in the Bogotá region we identify these types of in-between areas around small municipalities of the Sabana where that higher scale connection still has not appeared. This relates to the way large scale roads tend to appear afterwards, as it was observed in the other example of in-between areas in the border of Bogotá with the river. In that case, there was an in-between area with lack of homogeneity in the street or building pattern and combination of different types and sizes of parcels, roads and buildings with varied functions. The new transport systems adds another scale and new types of patterns and developments related to the logic of that system and reinforces the in-between character that was already present before. Therefore, we can affirm that the main condition influencing the in-between character of these areas is their location next to borders of different types.

In relation to the process of development, in both contexts these areas develop progressively by individual small scale interventions. One of the most important observations is the repetition of these types of areas in locations every time further from the centres as it was seen in both analyzed urban regions. The displacement of these areas every time more outwards is coupled to the urban growth in their direction and the absorption of previous in-between areas by that growth. At the level of the region, these areas form sorts of buffer belts, because of their character, more open than the surrounding residential tissue. Furthermore, their discontinuous street pattern can break the continuity of the street patterns around, especially those at the local and intermediate scale.

In general, the specific character of these areas as a mixture of the functions and typologies of their surroundings can contribute to understanding the contemporary urban landscape since they show, in a compressed way, the different layers that combine today at a larger scale. At the same time, these are spaces changing very fast and appear as temporary or leftover while new functions occupy them. It is in those areas that transformation occurs nowadays and that boundaries re-accept. They show how open space is slowly colonized by all sorts of functions that only these locations can assimilate (golf courses, communal gardens, amusement parks, sport facilities, schools or small condominiums among others). Furthermore, they show how, by slowly occupying rural areas in this way, leftover space remains, empty areas waiting to be urbanized enclosed and limited by urbanized areas of different types around them. Finally, when looking at these blurry borders in the sequence of historical maps, it is possible to observe that in previous stages of development areas completely urbanized today had similar configurations. At a regional scale, the network of these left-over areas becomes a unifying element located between dense and less dense areas.

8.8. Observations in relation to the spatial configuration at the scale of the region

At the beginning of this chapter, the two urban regions, Randstad and Bogotá-Sabana were compared with regards to their main spatial characteristics at the scale of the whole region. They were simply described as a polycentric region (the Randstad) against a monocentric one (Bogotá-Sabana region).

From the observation of the cross-sections, the homogenous areas and the relations between them in layers, another type of characterization comes forward. The Randstad appears then as a region formed by clearly enclosed pieces, almost in the form of islands interconnected in a network at an intermediate and regional scale. Each of these islands seems to be complete, in the way they appear formally as enclosed islands linked to the larger scale infrastructure in limited points. In this sense, the actual image of the Randstad seems complete and terminated, where change will occur in the form of another constructed island connected at limited points to the large scale road network.

This contrast with an unfinished impression in Bogotá, where areas seem to be incomplete, borders seem to be in continuous redefinition and transformation. Each area has the pattern of an open grid that could extend continuously. Since there are no highways in Bogotá in the way there are in the Randstad, these elements do not really isolate these areas. City scale roads are not as regulated and therefore they are less wide, without the necessary distance from housing areas and trespassed at much more points. The overall image is one of a continuous patchwork of different grids. Only recently,
this image starts changing due to the recent upgrade or construction of regional connections and the introduction of the new bus public system.

Probably due to the polycentric character of the Randstad, all the islands are connected and all new expansions become immediately connected to the regional network. However, it is that well-connected regional network which makes possible polycentricism. While in Bogotá, connections become less and of a lower scale when they are further away from the centres or from the city and regional scale connections. This creates peripheries, areas that are less connected, or with a limited number of connections compared to the rest.

In terms of a pattern at the scale of the whole region, we can describe the Randstad as an agglomeration of built islands interconnected with a background of in-between and agricultural areas. These islands form a net in the territory while they do not necessarily correspond to the municipalities defined administratively. On the contrary, between each municipal border of each of the municipalities forming the Randstad there are many of these interconnected islands. In comparison, the pattern of the Bogotá-Sabana region is of a branched type, as a tree structure with several derivations that become every time more local as they are further from the regional scale connection. These characteristic patterns for the two regions coincide with what was found at lower scales in the study of the homogeneous areas inside. They could be metaphorically referred to as a fractal configuration where the same spatial organizing principle repeats at different scale levels.
PART 4. Conclusions and evaluation
This chapter deals with the three sub questions which were raised in the introduction, as a preamble of the general conclusions in next chapter. These sub questions have already been developed along the thesis. This chapter sums up and compares these partial conclusions giving answer to the sub questions. In the first place, the questions about the traditional morphological analysis, theme of chapters 2 and 3 are answered. Second, the questions about the recent studies in the form of the landscape and the territory which were developed in chapter 4 and 5 and their relation to mapping, developed also in chapter 2, are answered. The conclusions of these two themes are more extensively formulated through chapter 6. Finally, the questions about the general and specific aspects of the relation of urban form and its context, developed through the case studies in chapter 8, are answered by dealing with the repetitions and differences encountered through the comparison. However, before this the case studies and the comparison process are evaluated and correlated to conclusions from other parts of the research, like those from the vocabulary review in chapter 2.
9.1. Traditional morphological approach, what to bring forward?

The first subquestion that needed to be answered before dealing with the main questions referred to the way urban morphology was approached by this research, the position in relation to existent studies and the essential elements and techniques which were studied in traditional morphological approaches. All these themes form the background that introduces the field where the research locates. Therefore, these issues were treated very early in the text in chapter 2 where section 2.1 dealt with urban morphology in general and chapter 3 dealt with the urban morphology tradition.

First, urban morphology is understood as the study of the logic of the form where form is understood as the arrangement of the parts. In relation to the traditional urban morphological approach, the observations from Moudon (1994; 1997) about the essence of a morphological study were the departure point. In that sense urban morphology deals with form, resolution and time. This abstraction by Moudon does not imply any type of city, neither a specific scale. Form is then the arrangement of the parts, in this case the parts are buildings, open space, streets and blocks. The arrangement of these elements is studied in their transformation through time and at different scales. This general understanding of urban morphology is, as endorsed and supported by Moudon and corroborated by the literature review and case studies in this research, applicable to the study of the recent developments and areas showing different spatiality from the traditional compact city.

Besides the general aspects of urban morphology, the three main traditions and the Dutch approach were introduced. Each of them has specificities in the understanding of urban morphology and in the studied elements and techniques. The table in page 51 summarizes these approaches. The important conclusions from these different traditions deal with the applicability to the study the contemporary urban landscape. The review of the traditional morphological approach brought forth topics that were potentially a contribution to the study of the contemporary urban landscape. Before we look at these topics in relation to the case studies to formulate general conclusions, we can mention them shortly.

To start with, some approaches, like the Muratori’s and Caniggias’s school are more concentrated in the building and building type. This limits the applicability of this approach in the contemporary city where, as it has already been developed extensively in this research, the binding element is the open space.

Other specific notions were very useful like the ‘tissue urbain’ that was compared to the ‘plan units’ from Conzen and the Dutch idea of ‘homogeneous areas’. Particularly the idea of ‘plan units’ as introduced by Conzen in his studies seems useful because it can be applied to different configurations that are not necessarily the centres of the medieval cities he analyzed. Furthermore, for Conzen and his followers in Britain, between the plan units we can identify fringe-belts which are the areas that do not show homogeneity in the pattern. This fringe belts can be also indentified between different types of developments. The concept of fringe belt from the Conzenean school showed to be useful for looking at the contemporary urban landscape.

Finally, the French studies showed that it is not necessary to understand the city as one type of traditional city against dispersed or modernist developments. There are different lines in which the city has developed in relation to specific models and ideas. Mapping the logic of the form helps revealing these different lines.

9.2. General elements from recent approaches

The second set of subquestions, or background questions, dealt with the recent attempts to map the form of the territory and the landscape. These were introduced in general and in their relation to mapping in chapter 2, section 2.2. Examples of these approaches and the different lines identified by this research were developed in chapter 3.

To start with, the first question concerning these studies asked about the way mapping was conceptualized. The studies identified within this line consider mapping as an essential element to study the territory and the landscape. The primary reason for this is that they are looking at regions that sometimes have not been mapped in their totality or in their current condition before. Mapping becomes then an important tool to visualize and to describe the actual condition of the territory. Because the territory and the landscape are understood as a product of many human interventions interacting with the existing, mapping also helps to uncover the different layers overlapped in the territory today. Finally, mapping is also approached in its projective character. Therefore, it is the tool for developing different future scenarios for the studied area.

The second question asked about the way these studies approached the morphology of the contemporary city. In this sense, as it was already explained in chapter 4, these studies adopt a different position in relation to the claim about relative autonomy posed by the traditional morphological studies. Their studies understand the form of the territory as something that should be accompanied by studies in other aspects which together explain the current state of the territory. There is also a clear position in these studies about learning from the landscape and the territory, not to obtain general facts about the territory today, but to generate specific approaches and ways to
act that are rooted in the particular characteristics that mapping uncovers.

The last question dealt with the essential elements and techniques used by these approaches. To start with, the review of the studies on the North American suburbia showed that the elements studied in the traditional morphological approach, form, resolution and time and specially the idea of plan units from Conzen were useful for studying that reality. They also showed the possibilities that GIS systems offer to incorporate quantitative information to spatial one. Furthermore, it was shown that these systems contribute to tackle the problem of scale when studying the contemporary city.

The studies in the European territory and dispersed city showed that these phenomena were not new and that a deep understanding through mapping of the transformations of the territory made clear the early origin of it and its specific logic and transformation through time. These observations correspond with those by the French studies about a continuity of different models that transform and repeat along the history of the city. Therefore, we should look at the historical transformation of the areas which we qualify now as form-less in order to understand the reason and logic behind that specific location and dispersion. The examples mentioned in this respect have done this. These studies also showed that repetitions in the territory could be understood as layers that overlap to form the image we have of it today.

Finally, in relation to the open space as the binding element in the contemporary city, we saw that attention should be given to the structure of that open space by looking at it as a cultural product. Therefore, the specific ground structure and transformation should be mapped as well as the accumulation of different human interventions on it.

9.3. The general and the specific: post evaluation of the case studies

The third set of sub questions dealt with general and specific characteristics of urban form in relation to the studied context. The way to tackle this through the research was by comparing two urban regions in very different contexts with two different spatial configurations at regional scale. Before answering the two sub questions, an evaluation of the mapping process of the case studies is needed. After parts one and two introduced the way mapping is context and subject bounded, because maps have been developed by an author, the mapping from the previous chapter is observed from a distance. This is achieved by making explicit the context of mapmaker and of the maps for the mapping of the specific case studies. Additionally, the comparison process needs to be reviewed. How did the comparison process occur? How did the mapping activity in one context influence further mapping in the other and vice versa? How did this comparison lead to conclusions for the two contexts but also on a general level? Finally, the themes derived from the review of the new vocabulary in chapter 2, as essential in the contemporary urban landscape, are contrasted with the observations from the mapped cases.

9.3.1 Context of the mapmaker:

In this case, as always, the context of the mapmaker and the relation to both case areas is very specific. In the first place, Bogotá is the author’s city of origin where she has worked on research in the morphology of the Bogotá region through participation in the projects ‘Tendencias recientes de Ocupacion territorial en Bogotá y la region’ (CEDE) and ‘Directrices de ordenamiento territorial para Bogotá y la region’ (CEDE-CAF-DAPD). This significant experience has generated a specific knowledge of the recent transformations of the region of Bogotá. It also has helped the author in becoming acquainted with the state of the art in studies about urban form for Bogotá and the region. These are not so numerous. That experience helped the author in recognizing the weakness of those studies and in that sense it inspired the initial approach to mapping the area. The previous studies were discussed in chapter 7, where these limitations were explained.

The relation to the second study area, the Randstad, is very different. In this case, the knowledge of the Randstad is posterior. It origins from the author’s study of Master course in Delft with design studios located in the Randstad. The previous experience of the author with Randstad was most of the time design oriented. Thus, the approximation to urban form and transformations from a scientific point of view, and without direct design aims, in the Randstad region only started with the PhD research.

This particular state of affairs influences the mapping process. The fact that the author had a limited previous knowledge on the Randstad region was in some ways an advantage because it became easier to follow a procedure in which the maps and the mapping process illustrate the characteristics of the region. The themes that should be researched deeper were guided initially by findings through the mapping. Furthermore, the fact that after the mapping of each region there is a comparison between the produced maps and the information extracted from them for the two regions makes these different backgrounds less relevant. Two regions with different contexts and with different relation to the author are looked at closely following the same conventions and mapping procedures.

9.3.2 Context of the map: intention or goal

In chapters 3 and 4, when looking at the context of the map, the aims of the mapping process was studied. More specifically, the expected results or conclusions from the
mapping process and consequently, the relation with design, were the focus point. Similarly, we can look at the goal of the mapping of the case studies and the way it influenced the mapping process.

The goal of developing maps as case study was descriptive and analytical in the sense that they were not aiming at any direct design application. However, it was argued from the beginning and through the text, that mapping is by essence already a design approximation to the specific mapped context. The intention through the mapping of cases was that the mapping process would guide the characterization of different areas. Thus, it was assumed at the beginning of the mapping process that the process itself would be guiding the steps to follow; findings in a map would guide the following ones.

However, another aim was to find the spatial logic of the study areas in the same way the traditional morphological approach has done for traditional configurations. In that sense, the mapping was attempting to follow a line of progressive levels of abstraction towards schemes. That abstraction was directed by the attempt to find the logic of transformation and to find formal principles.

In summary, the goal of the map, even if in this case it was not directed at any actor, institution or design assignment, influenced the way the sequences of maps lead to abstract schemes. This direction was also observed in some of the mappings reviewed in the Meta-mapping (part 2). Those mappings showed also a sequential direction towards abstract principles or schemes like in the study of Milan’s region by Boeri et al. (1993).

9.3.3 Signs and techniques

The signs, conventions and technical activities that produce a map are the result of the context in which the map is produced; they are conditioned by the available tools and rules at a specific moment. We will deal here with the relationship between the techniques and signs used, and the conclusions derived from the produced maps. The aim is to make explicit how the techniques selected, and the maps developed, follow the objective of the research. In that sense, they are all directed towards revealing the formal logic of the studied areas.

To start with, the main base maps were topographic maps and aerial photographs of the most recent dates available, as well as of different historical periods. From these bases, information was extracted to produce new maps. Those new maps attempted, in the first part of the atlas, to characterize each of the areas. In the second part, from the topographical map layers were extracted with the aid of information from the aerial photograph. These base maps proved to be productive to extract patterns and essential spatial and formal characteristics in all the different spatial configurations and types of areas encountered.

The objective of mapping of the different areas was to identify repetitions. These repetitions allow two types of comparisons. At the level of the region, they allow us to look at the whole region because those repetitions form different layers. At a more abstract level, those repetitions allow for comparison between the two contexts, the Randstad and the Bogotá-Sabana region. For this reason, the generation of schemes at a higher level of abstraction proved to be very useful.

In the production of schemes, the main attention was given to the relations between elements and the change of these relations in order to extract general principles. These abstract schemes contributed to bring the conclusions of the cases to a more general level, the level in which the research questions are stated. They illustrate the general inquiry about urban morphology of the contemporary urban landscape and about mapping as a way to uncover this. The conclusions in this direction support the hypothesis that there are repetitions that can be extracted in the contemporary urban landscape. The fact that schemes of patterns and processes of transformation can be produced, proves this point.

Finally, the signs and techniques used to produce a specific map are influenced by the available information and techniques at its production moment. Finding recent digital cartographic information for the Bogotá region was much more difficult than finding them for the Randstad. Because of this, sources like aerial photographs had to be partially digitized by the author, to achieve similar levels of information for the two contexts as explained already in chapter 7. Similarly, GIS information was not accessible at comparable level for the two contexts. Therefore, GIS was at the end not used in the cases. The mapping concentrated then on information that could be extracted from the available maps, searching for essential characteristics. It was an activity of selecting and extracting from the available information the elements that support the research objective.

9.4 The comparison process, found repetitions and differences

The section on methodology (chapter 1) described the reasons for the comparison in the case studies between the Randstad and the Bogotá-Sabana, and its intended goals. All through the chapter introducing the cases and the Atlas, the same themes were observed in the two contexts. This section initially develops around the question of whether the objectives for the comparison were achieved or not and in which way. It continues by enunciating at a general level the conclusions of the comparison which answer the two sub questions formulated in chapter one about repetitions in the formal logic of the contemporary city and aspects that do not allow generalization. Finally, it attempts to show how the production of the maps was a
process where findings in one context influenced further development in the other. The general aim is a plea in favour of comparative research. Comparative research is useful not only for finding generalities or shared points, but it is also by getting to know what is different that we understand what is near us.

9.4.1 Responding to the comparison objectives:

The main argument for the comparison refers to the issue of generalities and specificities about urban form in relation to the studied contexts. The research’s aim is to find general aspects in the form of the contemporary city, while showing how urban form relates and responds to a specific context, and mapping of urban form as the approach to reveal that relation.

In relation to the general aspect, the comparison and the conclusive tables with schemes show how the abstraction into patterns constitutes a level where comparisons between different areas and different contexts are possible. Within the identified patterns, we found similar configurations for both regions where the process of development from the closed block to the open one can be traced in both contexts. This evolution reflects the way governing urban paradigms at a global level influence the thinking about the city and its interventions in both cases.

Across the study of the homogeneous areas in relation to the regional scale, the way they constitute layers that overlap in the territory show large differences between the two contexts. It is through the mapping of these layers separately and the study of their interrelations that the differences become clear. These differences deal with a large scale highway network almost inexistent for the Bogotá case, and an intermediate network very connected to the local one, while in the Randstad case we see a very clear differentiation between the different scales of the road network and the connections between these different scales.

In both cases, the specific scales of road infrastructure and the relations between them are the product of the process of development and planning in both regions. In the Bogotá case, we see that the development occurs most of the times in direct relation to available land. This available land is not necessarily contiguous to existent developments and it is often connected to them by local roads which are not updated with the new development since they are not contemplated within a general plan. Only recently, with the POT (D.A.P.D. 2003) we see city scale connections overlapping the existent fabric and upgrading of local roads to satisfy the requirements of the amount of neighbourhoods and population they serve. In the Randstad, the connection is precondition for a plan. These opposite processes are clear through the historical reconstruction in maps of the transformation of the areas.

The example in previous paragraphs shows a general process of observation that starts by the definition of homogeneous areas, and goes to define layers from those areas and to study the reasons for formation of those areas. This study applied in two different contexts, and together with the extraction of abstract patterns it allows uncovering and showing specificities of each context. The comparison produces conclusions in relation to the correlation between patterns and layers and how the contemporary urban landscape is the product of the interaction of those layers. The generalization is developed with the aid of schemes that abstract those patterns, layers and different types of relations between them.

9.4.2 The comparison as a non linear process, specificities of each context guiding following steps

At the beginning of the research, the methodology to map the cases was defined. This methodology was the outcome of studying the traditional approaches to urban morphology which define elements and scales to be mapped. The idea of the cross-sections and their definition was also pre-defined. In that frame, the initial base maps were comparable for both contexts. They should contain the different elements of a morphological analysis, the different scales and historical periods. From this common base, the mapping process went parallel between both contexts. The mapping comparison process developed without a strict order. This means that specific types of maps were developed for one of the contexts and then applied to the other. Through this parallel mapping, observations for a specific area in one context affected the subsequent observation in the other context. A specific identified characteristic illuminated aspects of the other context, either because it was similar or precisely because it was absent and opposite in the other.

Some examples of these diverging characteristics encountered in one of the two contexts and the way they influenced the further mapping in the other context are:

- The degree of connectivity between the different parts, in this case homogeneous areas, in the various scales is very different, almost opposite for both contexts. In the Randstad, there is a clear hierarchy from the highway network down to the local streets and rural roads.

  In this frame, for the studied area there is a very clear sequence between the scales, with decreasing connections as the scale of the road increases. Highways have limited numbers of entrances and exits. Within this hierarchical organization, all homogeneous areas are very well connected to each
other by the higher scale. On the contrary, many areas in the Bogotá region have bad connection to the city scale network. They connect with the rest of the city by local roads with insufficient dimensions. However, at the local scale, there is much more continuity within the different areas in the Bogotá region than in the Randstad, where the precise hierarchy creates disconnections at the local scale and makes areas dependant almost exclusively on the national road infrastructure.

- The disconnection at local scale in the Randstad against the continuous grid in Bogotá: the previous point is reflected in the way parts connect and the regional vision they reflect. In Bogotá we see a continuous carpet of different grids, connected to each other at various points. In the Randstad, we see fragments with an internal gridded pattern that form islands which only have continuity at very limited points with each other.

- Opposite directions in the process of development in both areas and opposite order of appearance of the elements: In the recent developments in the Randstad, we observe how in the process of development of an area first the large infrastructure is laid down, the connections to the existent road system and afterwards neighbourhoods are developed. In the Bogotá case, especially in the studied border areas from illegal origins, the process can occur in the opposite way: from the development of a unit in a specific parcel and after a certain degree of consolidation of the urban block or neighbourhood, to the upgrading of the road connection of this area to the rest of the city.

- Finally, the main characteristics of the regional structure in both cases, elucidated through the study of the separated parts, also diverge. However, that divergence helps to explain something about both. The region of Bogotá, constructed mainly of gridded fragments, does not work as a gridded network at the regional scale. It works as a tree structure with branches that derive from regional ones successively into local ones. The Randstad region, constructed by many non gridded patterns (cul-de-sacs, super-grids with derivations) appears as a net of interconnected parts almost in a homogeneous way. This net is laid down on the territory connecting all the parts to each other and outwards to other regions.

As we can see, the comparison process led to adaptations. One map influenced the next one whether it was in the same context or in the other. The knowledge acquired transformed the approach to the maps in following stages. It was not a unidirectional process where one context taught the other but bi-directional. We could say that the comparison teaches new things in the sense that it is possible to learn from the difference, from what one context has and not the other, and from the specific reasons for this. However, between the differences encountered, the processes of mapping were constant and that is what allows finding the specificities of each context.

### 9.4.3 Coinciding themes

As explained in the previous section, there were specific themes that due to the large difference between the two contexts, when observed in one context, helped explain why the other context was different or why that specific characteristic was not present. Similarly, there were common themes which helped to explain global models and shared paradigms. These themes allow us to talk about repetitions across different contexts.

- There is a limited repertoire of physical elements with which the urban form and space is constructed. This is illustrated with the different patterns encountered in both cross-sections in chapter eight, where similar types of blocks and patterns were encountered. These elements have been transforming with time. They also transform in relation to the functions and scale of the functions which they contain. These transformation lines are present in both contexts. Examples of them are the dissolution of the block into the slab, the change from the closed block to the open one and recently back to the closed block, the emergence of a super-grid, and the change of scale of the block for large functions in border areas.

- A common tendency in both of the studied regions is the change of scale through different periods. First, the enlarging of the scale from the city towards urban regions; second, the increase of scale of its parts and its infrastructure; and finally, the attempt in the planning mechanisms to cope with this scale change.

- Due to the change of scale, areas are left in-between. This is found for both contexts as areas without recognizable homogeneity where different scales collide (See 8.7.3 for common characteristics of in-between areas).

- Four types of growth in relation to the existing fabric were identified for both contexts: Concentric growth related to one centre, growth by neighbourhoods related to one centre or discontinuous from existent centres, and growth following highway connections (See 8.7.2 for explanation of each one of them).
9.4.4 Typical contemporary themes and their relation to the mapped cases

Chapter 2 offered a revision of the different vocabulary which was developed, especially along the second half of the twentieth century, to name the transformations the city experienced and the new totality which emerged from these transformations. As a conclusion of this review, six different themes where extracted. These themes appeared repetitive along some of the studied terms as the relevant spatial issues or new spaces and tasks in the contemporary urban landscape. They were then the initial point of reference to define the approach in the mapping of the cases. Now that the cases have been dealt with, it is important to look back at those themes in order to confront them with what can be concluded from the mapping of the cases.

- The new role of open space:
The common maps related to the relation built versus open space in the traditional city are of the type that is well described by the figure-ground maps. Open space is clearly defined by the built. In the maps of the case studies we saw that the open space becomes the main element defining the super-grid and in the case of the Randstad is then the binding element between the different islands. Similarly, the peri-urban circuits in the borders of consolidated areas in the Bogotá region have as the binding element the open space which is the background for dispersed lineal developments. In general, the in-between areas we found for both cases can essentially be characterized as having the open space as the binding element. They become the transition between a compact city of confined open space, to one of super-grids defined by lineal green elements, and one of rural character where the proportion open versus build is inverse.

- In-between areas and leftover space:
The maps showed that the splitting in different layers can be very informative for some aspects of overlapping scales. We also observed how in-between areas can be recognized in the collision of these layers. Because of its character, it is a space which can easily be left out of the maps. The procedure of mapping layers and simultaneously studying the collision of these layers proved to be very productive in identifying these areas and bringing them forward in their internal characteristics, in combination with the influences from the surrounding homogeneous areas.

- Boundaries, borders
The mapping of the cases shows the role of borders in the generation of in-between areas. It simultaneously showed borders of different types, particularly spatial borders created by infrastructure that while connecting at a regional scale become borders to local connections. In short: the notion of borders is also dependant on the scale of observation.

- The ground and the territory
If there is a new role for the open space in the contemporary urban landscape as the binding element, then the underlying layer of a study should be the ground structure, the territory as the base for future urbanization and transformation. The maps showed how in the in-between areas, the pre-existing ground structure and rural traces can explain the future development and densification.

- New uses, new types and new sites, new centres and new relations
The maps show that mainly in the in-between areas, but also in all rural areas in both contexts, new sets of functions begin to concentrate. These functions deal mainly with retail and leisure. These areas without an apparent structure or clear linkage to the pattern of the existent city are becoming the new centres because of these functions and because of their location: central because of its accessibility by automobile through the road network connecting them at regional scale. These are new tasks to be approached, new sites to be observed, which are different from the existent traditional centres.

- Infrastructure and Networks
The way areas interact in layers show how important it is to think in terms of the networks that are interconnecting areas in the territory today. The basic structure that allows the existence of a ‘city a la carte’ or ‘carpet metropolis’ is the infrastructure creating networks. Besides understanding areas in their internal logic through mapping, the networks connecting each area to others need to be mapped in order to understand the essential role of these in the transformation of the contemporary urban landscape.
This chapter starts by answering the three main research questions formulated in chapter 1. The first question is about generating a common generalized knowledge about the morphology of the contemporary urban landscape. The second question deals with identified common and repetitive spatial features and principles of formation. The third question has to do with the elements, scales and abstractions which are relevant when mapping the morphology of the contemporary urban landscape. The second part of this chapter develops around recommendations for future research and possible design tasks in the contemporary urban landscape that emerge from the conclusions of this research.
10.1. How to generate a common and generalized knowledge about the formal logic of the contemporary urban landscape?

To start with, it is important to highlight that the various reviewed studies, as well as the cases, demonstrate that the study of urban form in the contemporary city is still informative because it reveals specific characteristics and processes inherent to its physical dimension. These studies contribute to the visualization and awareness of the reality of the territory today. They give an image of the dimension of urban agglomerations and the dimension of the influence of the urban in the landscape that other types of studies of a more quantitative type could not give.

The answer to the first research question, the title of this section, is the research itself. The process to produce a generalized knowledge about the formal logic of the contemporary urban landscape is the path that we followed. It can be briefly enounced as a comparative process, not only because two regions were compared in the case studies but because every reviewed studied and every term of the vocabulary was observed with the objective of heading towards generalized observations. In this process, sometimes ideologies were given a second place even within different theoretical backgrounds to concentrate instead on common points. What this process showed was that theoretical texts, as well as case studies had both indentified spatial features which were characteristic of the contemporary city. Those spatial features are the theme of the next sub question and are discussed in more details in the next section.

This answer is nevertheless unfinished. It becomes a recommendation for future research to continue documenting the current transformations and logic of the form of the landscape through mapping, while developing comparisons that can make this answer more robust every time. However, the most important issue for future comparisons is that they should both concentrate on the understanding of generalities as well as specificities.

10.2. Common or repetitive spatial features and principles in the contemporary urban landscape

In view of the common observations of different studied contexts, both through reviews of existing studies and through case studies, the contemporary city can be understood as a continuous urban landscape where different patterns overlap at different scales given by connection through different scales of infrastructure. The apparent formless character of the contemporary city can be understood if we identify layers composed by homogeneous areas that overlap in the territory. In that sense, a region emerges as a combination of two types of structure that overlap as layers:

The first is a structure of overlapping layers of areas with comparable patterns that spread in the territory. Each layer contains areas of similar pattern but they are not contiguous, but neither the observation at the regional scale nor at more detailed scale shows it. Because each area shares the same type of relation to the rest and the same logic of transformation, they are not spread in the territory arbitrary but following the same principles. When the different principles of each layer are uncovered, the structure of the region is revealed as the overlapping of these layers.

However, the overlapping layers only explain one part of the contemporary city. Overlapping layers are composed of homogeneous patterns that when overlapped seem to loose the pattern. Areas without homogeneity emerge when these layers collide or when layers with a new logic, for example, the highway, overlap existing ones following logics from previous periods of development. These areas are called here in-between and they also become a layer in the territory that together with the overlapping homogeneous layers can explain the spatial structure at a regional level.

Identifying generalities and specificities

While that understanding of layers and in-between areas as a layer between the first ones is general, the specificities of each layer, the relation between layers and the way they create those in-between areas varies between contexts, as it was observed in the case studies. Some layers, for example, those formed by the influence of highways on new developments, are common between different contexts. They were identified in existent studies and also in the case studies. However, the way new developments occur, the way the highway relates to the existent and how it overlaps to other layers is very different per context.

Similarly, while the study in different context shows similarities at the level of the pattern inside a specific homogeneous area, the relation of areas of similar patterns and their surrounding is very different. This results in different layers at the regional scale. The repetition at the level of the pattern (relation building, open space and street) allows us to identify stories in the transformation of these patterns that are common for different contexts. This is the case for example for the dissolution of the closed block and the emergence of large peri-urban blocks. However, the layers they form at regional scale are different and specially the in-between areas which they form.

Nevertheless, the way we can uncover those differences and specificities in the context is by going through the whole process at the two scales: first, the scale of the homogeneous area, the relation to its surroundings and its transformation process and second, the identification of the layers. The following section will explain the elements forming the layers and the process for their recognition.
10.3. Mapping elements, scales and abstractions

This section deals with the last question, dealing with the elements, scales and abstractions relevant to map the morphology of the contemporary urban landscape. Furthermore, it asked whether these were similar or different from those developed by morphological studies of more traditional urban areas.

The elements and processes of abstraction developed through a traditional morphological study relate directly to the object of study and especially to those areas more intensively studied along morphological studies, namely, those of historical centres. As a result, they are based on a scale sequence between the building/parcel, street/block, and city or region and deal with a type of configuration where the built element is the background, constituted by blocks, where open space is confined within the built, forming mainly squares, parks or streets. The question this research enunciated was about the elements, scales and processes of abstraction of a morphological study in the contemporary urban landscape.

The two-folded approach towards the research questions, through both a review of studies using mapping and a case study of mapping reveals the elements and scales that can constitute a base for understanding the formal logic of the contemporary urban landscape. The process to uncover the morphology of an urban region as shown by this research can be developed from the mapping of the part towards the mapping of the region. The study of the part, a homogeneous area, is a common practice in traditional morphological analyses. The observation of the repetition of homogenous areas across a territory in relation to the types of infrastructure that connects them shows the existence of different layers. The understanding of territory as overlapping layers is observed in recent studies of urban form. The interrelation between a part and a layer allows for a study that contemplates simultaneously multiple scales.

• **Homogeneous area**
  
  A studied context can be observed as a collection of homogeneous areas. These can be identified on basis of homogeneity in the pattern observed in the relation between buildings, open spaces and streets. Normally these areas are identified for rather compact developments where it is the structure of building blocks together with streets that form a pattern. Here we refer to a much broader idea of homogeneity. Patterns do not necessary form closed blocks, as found in the reviews and cases, branched types can repeat without necessarily ever forming closed blocks of surrounding streets. Homogeneity can be identified within different proportions between built and open and even in totally non built areas where the homogeneity is then identified in the road pattern or in structure of the ground, the soil and natural elements.

• **Relation of area to surrounding**
  
  After a study of a homogeneous area in its internal logic, as it has been done by traditional morphological approaches, it is necessary to observe it at an intermediate scale in the way each area is bordered and is connected to the surroundings.

• **Understanding the contemporary urban landscape as overlapping layers**
  
  The ideas of plan units, areas of a homogeneous pattern, and fringe belts, areas of non-homogeneity in the pattern, were re-interpreted at a regional scale. The plan units, called here homogeneous areas interact with similar ones by repeating the same type of relation in the existing infrastructure and surrounding landscape. In this repetition, they form layers. Inside each layer, areas of similar pattern are spread in the region. The contemporary city at the regional scale can then be understood as overlapping layers with different patterns.

• **The layer of areas without repetitive pattern**
  
  Between the different layers, there are areas without a homogeneous pattern. This is the reinterpretation of the concept of fringe belt that when observed at the regional scale as the space left between layers, it reveals a new layer at the regional scale. The different elements of different layers sometimes are lying against each other, connected by an intermediate scale street or road. Sometimes, homogeneous areas collide or overlap as fragments of each other in a specific area; or sometimes, borders of homogeneous areas overlap on borders of other areas. These areas are examples of what we call in-between. Their identification is only possible if we look at the relation of each area and its surrounding and if we look at the regional overlapping layers and we focus our attention in the conflict areas of that overlapping. The idea of in-between areas was found in the reviews of literature and in the recent studies of the landscape and territory (Berger 2002, 2006; Pope, 1996; Lerup, 2000; Frijters, E., D. Hamers et al. (2004); De Meulder and Dehane, 2002; Boeri et al., 1993). However, we see here how it emerges a whole new structure with its own logic in the contemporary city and with a potential that will be discussed later.

• **The layer of dispersed points**
  
  One layer, different from the one formed by areas with homogeneous pattern and from the in-between areas is formed by punctual dispersed elements of similar type and formal and spatial characteristics. This layer of dispersed elements is formed by large blocks containing functions with large-scale impact. They condition future developments in their surroundings and the laying down of new infrastructure. They are for example large functions like the airport or large parks, but they can also be closed housing ensembles like observed in the Bogotá-Sabana region case.
• **Scales**
The contemporary urban landscape can be understood at three scales, the scale of homogeneous areas, the scale of the relations between areas and the regional scale in which areas form layers that overlap. What is important is that the study should contemplate the three scales. In this type of observation the homogeneous areas are the essence of the regional form, equivalent to the building block for the traditional city. The scale of the region can be understood in two directions: first, as a system of overlapping layers with leftover areas in-between; second, as a collection of homogeneous areas structured by infrastructure at regional and intermediate scale.

• **Multiple scales**
The study of urban form in a region should maintain a constant observation at both the scale of the interaction between areas, the scale of layers overlapped and the changes between these relations. From an understanding of the form of a region within this interaction, it is possible to find repetitions that emulate situations at local scales with those at higher scales of observation. This multiple scale observation also allows us to contemplate the regional impact of local interventions. This means that we start thinking in terms of the contemporary urban landscape in all its dimension and diversity but also in terms of the impact of local intervention in the regional configuration and vice versa.

• **Abstraction of patterns and processes**
In the same way as it is possible to abstract a pattern at the scale of a homogeneous area, it is possible to identify patterns at the level of the relations between areas. These patterns can be identified after a historical reconstruction of the formation and transformation of areas and their relation to the surrounding landscape. This process allows finding layers at another level, namely, between different periods. The abstraction of the process of formation and transformation shows how the elements add and transform in their relation to the surrounding. It is also this process that allows comparisons between different contexts.

• **Parallel stories materialize in different layers**
While in the traditional city, different stories could be identified on bases of the relation to one centre like concentric or contiguous towards the periphery, at a regional scale this type of relation is not relevant. The different stories that could previously be understood as growth rings on a trunk, are now overlapped, contiguous to each other forming a patchwork. Still the idea of stories that repeat can be followed when layers can also be identified between areas at different periods. The same occurs for the in-between areas that were identified as fringe belts already in medieval towns, and are now layers at a regional scale. What is new is the dimension, augmented by elements from a highway system that makes it more difficult to redevelop these areas in the way fringe-belts were redeveloped historically. However we will see how these areas can be considered as potentials at the regional scale.

• **Potential of GIS**
Finally, the mapping review shows how the correlation between the territory and quantitative data that GIS offers can inform designers about multiple conditions of an urban site. Specifically, GIS allows quantifying spatial aspects like sizes and dimensions of plots, blocks, roads lengths, and distances. That quantification, related to formal and spatial observations can contribute to the evaluation of specific sites. GIS also helps the comparison of variables at different scales of aggregation while remaining linked to the formal and spatial dimension of an area. Even if maps using GIS could not be developed in the case studies, the literature review showed that this tool can be of great use when thinking about vast and borderless urban expansions. This is due to the possibilities to connect observations at different scales and to cope with the scale of large urban agglomerations that can then be observed at a high level of detail. GIS tools were not used in the mapping of the cases, but they are dealt with in the recommendations to future research.

10.4. For future research

The two-folded character of the methodology of this research, with a review of mappings on the one hand, and mapping case studies on the other, together with the broad review of mappings, formed the extensive material for the research. This was intentional in order to cover a very broad scope in the recent mapping revival, as well as in the mapping of the cases. While some researches opt for a very deep and intensive study of one topic, here a broader approach was intentionally chosen that sometimes had to sacrifice depth. This is because the overload of information today, and for this research, the overload of maps, makes necessary to make sense of that vast amount of information in order to indicate directions for action. This section attempts to highlight some of those directions.

10.4.1 Case studies

An important part of the research was the comparison between the mappings developed for two urban regions, the Randstad and the Bogotá-Sabana region. The availability of maps for the two regions was limited in relation to the most recent developments. The most recent information for the two cases was from 2005 and this was only for aerial photographs. Digital maps were older in both cases. The dates of the material used leave room for action. This section attempts to highlight some of those directions.
The planning changes experienced in the two contexts recently are not the same. In the Bogotá region, developments under the guidelines of the POT of 2003 and of its application elements, the UPZ46, have started appearing. This occurs simultaneously for the small municipalities of the region. At a regional scale, the negotiation table between Bogotá and the other municipalities of the region has been reopened and probably it will develop some common regional agenda that will influence local planning. In the Dutch case, the Nota Ruimte of 2007 will also start showing influences in the space as well as the concrete projects to realize the Randstad 2040 structural vision.

As it was already intuited from the mappings, at some level the differences between the two contexts in scales of planning, reflected in the spatial characteristics tend to be more equal with the recent developments. In the Bogotá-Sabana case, the POT introduces the need to develop partial plans and urban projects. It also introduces a new large scale road network which overlaps the existent, attempting to solve the deficiencies at that level observed through the mapping. In the Randstad, the new planning scenario is more free and decentralized. The spatial implications of this still need to be observed by constructing a more recent set of maps. This mapping, if developed, can probably show whether that tendency identified here, where the two contexts tent to share similar spatial and formal characteristics, continues.

At a more general level, other comparisons between urban regions should be developed in order to test the procedures used through the comparisons in this research. Furthermore, comparisons can also contribute to studying the relation between patterns at different scales, overlapping layers and regional form.

10.4.2 Mapping urban form in relation to other dimensions of the urban landscape

While the study of other contemporary maps to those of urban form, shown in chapter 5, gave a broad overview of all the recent mapping production, the case studies only dealt with mapping in relation to urban form. This is because the object of the research was the physical and spatial characteristics of the contemporary landscape. The objective was to advocate the spatial and formal observation of the urban landscape as a valid approach today and to recognize the insight this could give in the process of transformation of the contemporary urban landscape. After this has been achieved, it remains for future research to study the link that can be made to mappings of other aspects of the contemporary urban landscape. This must be done in order to derive conclusions based on cross-comparison about the processes of transformation in relation to spatial and formal aspects against other more quantitative aspects.

For example, a comparison that could result in very informative conclusions is one between travel times and connections. Maps of connections between areas through different scales of road infrastructure were developed here in the form of layers. The way the features in the map can be distorted when linked to information about distance in time and how distance can be relativized, can complement the observations about connectivity between areas. This can help with visualizing the way new developments appear only in connection to the highway and the way the parts of that layer are nearer to each other than the topographical map shows. New centres between distant places can emerge from those maps.

The increasing amount of data and variables involved in the mapping of an urban site deals with an essential characteristic of the world today that affects the urban globalization. This means the enlargement of the scale of the world, while realizing that any given site is influenced by global variables. Maps produced recently combine information of different scales in the way they affect a specific site.

However, parallel to the homogenization brought about by globalization, the contemporary city deals a lot with specificities. Through those specificities, a place can be characterized and differentiate itself from the rest in order to become attractive. Mapping becomes the way to highlight those specificities. It is the tool that uncovers them while it is also the means of representation and communication. The large production of atlases recently is one example of that. This relation between globalization and local specialization and differentiation revealed through the mapping process should be explored further.

10.4.3 Cartographic enthusiasm

At the beginning of this research, a large amount of time was dedicated to the collection of cartographic information in order to develop the mappings of the case studies. Not in all cases information was available or sometimes it was too expensive to obtain. Along the five years that this thesis lasted, maps have become even more accessible to a larger public. Google earth and all the internet sites that work with this tool are some examples; other examples are the navigator systems. At the same time, these devices start allowing personalization. For example, navigation systems adapt to the location or decisions on the route of the user. Similarly, Google earth can be personalized. This could be seen as a change from the map as a static element to a more dynamic map, meeting the needs of the user. A large field that has opened up in many disciplines, since this cartographic enthusiasm is
appearing in many disciplines, is the study the implications of this. For example, how this daily contact with maps and these devices using maps change the experience of users of urban space?

10.4.4 Design tasks

Finally, the investigation into the morphology of the contemporary urban landscape shows a series of sites that need to be addressed by urban designers since they become potential tasks. Furthermore, these new sites need to be identified in other contexts, in order to develop even more comparisons between different contexts in the world.

- Different scales of connections: This research showed, through the mapping process by comparing two different contexts, the Randstad and the Bogotá-Sabana region, that there is a clear hierarchy between scales in the road network of the Randstad in contrasts to the Bogotá-Sabana case. At the same time, this clear hierarchy creates disconnections at the local level which has only very limited possibilities of interconnection through the super-grid or through the regional and highway system. This finding is clearly an important theme for further design-research investigation. Which kind of other intermediate connections could be designed in order to solve that disconnection at local level?

- In-between areas: The areas left in-between the different layers and connections through the landscape, identified through the research in the review of the vocabulary, the review of maps and in the case studies, are a design task which needs to be addressed not only by urban designers but also by planners. These areas do not only have to be seen as problems. Even though they show discontinuity in the street and built patterns, and sometimes they constitute borders to development, their open character and the way they form a layer at the scale of the region can constitute a potential. Moreover, their location and condition between different densities and types of occupation, as well as their predominate leisure functions can even show them as possible future centres at a regional level.

10.5. Closing

This thesis has brought us on a journey across the morphology of the contemporary urban landscape. In order to do so, it was necessary to cover sections of other journeys. It was necessary to study the terminology developed to name the contemporary city. Each of those terms often said something about the context which developed it and about a specific way to conceptualize the space of the contemporary city. Similarly, it was necessary to go on a journey through the mapping production of practitioners and researchers in the contemporary city. Again, as in the case of the vocabulary, each map said something about the context in which it was developed, while it showed a vision about the contemporary city.

At a very general level, it is a journey framed by the complexity of the contemporary city that is given to us a large amount of variables and information we need to take into account when researching and intervening there. Within this complexity, it is clear that all interventions and observations are context bound; not only the context of the observed site but also the context of the observer. The response from this research was also context bound. It had as viewpoint the morphology, aiming to highlight the morphological observation as a valid one, and not as exclusive but as complementary to those others identified along the thesis.

It was shown that while the word urban is broadened, and the contemporary city is not as physical bounded as it was before, there are very important physical implications for this and mapping is the tool to understand them. Furthermore, it showed that a study of the morphology of these new sites and areas can give us, designers, tools to make concrete interventions. But at a general level it can also be the context from which we can approach that complexity.

Finally, this was a long journey and as such, when the end is reached the context where it started has transformed. In this case, even more since the object we are looking at, the contemporary city is essentially in continuous change. Still, some elements persist and some processes repeat as it was shown for processes of transformation of the physical aspects studied.


Verweij, L. and J. Konings (2002). 64 minuten in 3 seconden. De hogesnelheidslijn door Nederland. Rotterdam, Uitgeverij 010


Ruimtelijk gezien is de stad niet meer een begrensde eenheid. Steden zijn onregelmatig gegroeid en verspreiden zich in verschillende ruimtelijke vormen over het omliggende gebied. Terwijl sommige beweren dat deze eenheid vormloos is, kijkt dit onderzoek juist naar de vorm van deze uitbreidingen. In plaats van deze uitbreidingen te zien als tegengesteld aan de compacte traditionele ontwikkelingen of benadrukken wat ontbreekt aan deze uitbreidingen in vergelijking tot de traditionele stad, wordt hun eigen ruimtelijke karakteristiek onderzocht. Sommige auteurs pleiten dat de open ruimte meer dan de gebouwde ruimte het bindend element is in de bestaande stad. Anderen verwijzen naar de grote bouwblokken of naar de nieuwe centra die in relatie tot het infrastructuur netwerk zijn ontstaan. De groei van de stad en haar vorm in een gebied volgen een specifieke logica die ontdekt moet worden. De identificatie van deze logica is het doel van dit onderzoek.

De ambitie is om gemeenschappelijke ruimtelijke aspecten en principes van ontwikkeling te identificeren in het hedendaagse stedelijk landschap om daarna algemene kennis te genereren over de ruimtelijke vorm van dit landschap. Om dit te doen moet eerst het onderzoekobject verduidelijkd worden, namelijk hoe is het huidige stedelijk landschap in recente theorieën gedefinieerd. Hiervoor is het vocabulaire om de ruimtelijke veranderingen van de stad te beschrijven gedurende de tweede helft van de 20ste eeuw onderzocht en beoordeeld. Sommige auteurs beweren dat de essentie van de veranderingen niet ruimtelijk is, anderen verzetten zich hiertegen en beweren dat de stad wel degelijk ruimtelijk veranderd is. Maar het merendeel erkent dat de nieuwe informatie- en communicatie technologieën, mondialisering en individualisering ruimtelijke transformaties teweegbrengen. Dit onderzoek sluit aan bij de stelling dat transformaties zich hebben voorgedaan in de ruimtelijke vorm en configuratie van de stad en dat begrip voor deze veranderingen essentieel is voor het stedenbouwkundig ontwerp.

De literatuurstudie volgt twee richtingen die de stedelijke vorm bestuderen. De eerste literaire richting is de traditie van de morfologische studies die in de jaren 70 en 80 van de vorige eeuw zeer invloedrijk waren. De morfologische studies hebben een algemene toepasbare kennis bereikt die ingezet kan worden om verschillende stedelijk gebieden te bestuderen. Maar deze studies hebben zich voornamelijk beziggehouden met de historische stad en verschillende auteurs bevestigen dat de studies daarom beperkt toepasbaar zijn in de huidige stad omdat deze andere ruimtelijke verschijning vormen heeft dan de traditionele stad.

De tweede literaire richting onderzoekt de meer recente studies over de vorm van de stad en haar omgeving en dan met name de studies die na 1990 zijn gemaakt. Deze meer recente studies hebben een aanpak ontwikkeld om de vorm van de stedelijke omgeving en het landschap te bestuderen en dit te vertalen in kaarten. De studies leggen de nadruk op de noodzaak om zorgvuldig de bestaande condities te karteren om daarna ingrepen te doen die gebaseerd zijn op de specifieke ruimtelijkheid. De studies hebben als doel om praktisch toepasbare resultaten te krijgen middels erkenning van de kansen die kaarten bieden. Deze studies zijn echter voornamelijk toegepast in specifieke situaties en voornamelijk in Zuid-Europa. Daarom zijn ze meer locatiespecifiek en zijn niet algemeen toepasbaar zoals wel het geval is in de morfologische studies.

Om de morfologische logica van de huidige stad te onderzoeken worden beide richtingen kritisch gereviewd. Van de tweede richting wordt kennis opgedaan over de vorm van het hedendaagse stedelijk landschap, terwijl tegelijkertijd de morfologische aanpak wordt geconfronteerd met de meer recente transformaties van de stad. De aanpak van de review is afgeleid uit cartografische theorie. Drie hoofdthema’s zijn bestudeerd, namelijk de context van de kaartmaker, de context van de kaart en de techniek en de mate van abstractie. De belangrijkste doelstelling van de review van alle studies is om algemene aanpakken te vinden die toepasbaar zijn om de vorm van het huidige stedelijk landschap te karteren.

Van de bestaande morfologische studies zijn de drie belangrijkste type scholen die gegroepeerd zijn in de International Seminar of Urban Form (ISUF), namelijk de Britse, Franse en Italiaanse scholen en ook de Nederlandse context gereviewd. Het doel van de review is om de elementen, schaal en type van abstractie te identificeren en te onderzoeken of deze toepasbaar zijn in het hedendaagse landschap. Uit de review bleek dat de concepten “Plan units”, “Tissue urbain”, “Homogene gebieden” en “Fringe belts” naar voren komen als mogelijk toepasbaar op elke stedelijke vorm.

De recente onderzoeken richten zich op de specifieke karakteristiek van het bestudeerde gebied. Niet door
het nabootsen of door het identificeren van verschillen in vergelijking met traditionele stedelijke vorm, maar door het benadrukken van de specifieke kwaliteiten en vorm van organisaties die meer gerelateerd zijn aan de structuur van het landschap, de open ruimte en de infrastructuur dan aan het bebouwde deel. De wijze waarop dit gedaan is middels kartering. In de studies zijn de bestudeerde gebieden zeer nauwkeurig en gedetailleerd gekarteld om hun ruimtelijkheid te kunnen beschrijven. Essentiële onderdelen van deze studies zijn dat de kaarten verschillende types vanoccupatie van het gebied aangeven, hoe het proces van transformatie is verlopen en de lagenbenadering waarbij informatie wordt geabstraheerd van gedetailleerde kaarten. Het operationele karakter van de kaarten blijkt uit het feit dat veel van deze studies proberen om verschillende scenario’s weer te geven voor toekomstige ontwikkeling. De interesse in kaarten van deze studies maakt deel uit van de herleving van het karteren, blijkend uit de vele recent gepubliceerde studies van kaarten en atlas ten die zijn besproken om de context van de kaart te verklaren.

Na de bespreking van de literatuur, is het tweede gedeelte van deze thesis ontwikkeld aan de hand van casestudies. In de cases zijn de bevindingen van de literatuurstudie toegepast in twee verschillende contexten met verschillende ruimtelijke kenmerken en een verschillende cultuur van planning, namelijk de Randstad in Nederland en de regio Bogotá in Colombia. De cases zijn noodzakelijk om de bevindingen van de literatuurstudie te controleren en om relatie tussen algemene aspecten (daarom zijn twee zeer verschillende regio’s gekozen) en specifieke aspecten in de stedelijke vorm bij een specifieke context te vinden.

Allereerst zijn gebieden met een homogene stratenpatroon geïdentificeerd en is hun interne logica bestudeerd. Hierbij is gelet op de belangrijkste elementen, namelijk het perceel, het gebouw en het bouwblok. Op deze schaal zijn verschillende types van blokken en patronen gevonden, van gesloten blokken waar de grens is bepaald door het gebouw, tot grote open blokken waar de structuur bepaald is door plattelands infrastructuur netwerk met de openruimte als belangrijkste element. Op de tweede plaats is het transformatieproces van het gebied gekarterd om de relatie tot haar directe omgeving of tot de hele regio te onderzoeken. De bevindingen zijn dat als op regionaal niveau gekeken wordt naar homogene gebieden, dat dan lagen aanwezig zijn die bestaan uit herhalingen van homogene gebieden door het hele territorium. Omdat zij op eenzelfde manier aan de omgeving en aan de infrastructuur gerelateerd zijn, vormen deze gebieden lagen. Naast de homogene gebieden, komen ook in beide contexten speciale gebieden naar voren die niet homogeen zijn in hun patroon. Kaarten op hoger schaalniveau die bestaan uit verschillende lagen met homogene gebieden tonen dat deze speciale gebieden vooral voorkomen op plekken waar verschillende lagen elkaar overlappen. De confrontatie tussen verschillende lagen genereren deze tussengebieden die gelijktijdig een eigen laag gaan vormen in het gebied.

Beide regio’s hebben kenmerken die overeenkomen en die van elkaar verschillen. Overeenkomsten zijn te vinden in de patronen van de homogene gebieden. Verschillen zijn te vinden in de relatie tussen deze gebieden en haar omgeving. In de Randstad is er een duidelijke hiërarchie tussen het lokale, intermediare en regionale infrastructuurnetwerk. In Bogotá spelen wegen tussen homogene gebieden op alle schaalniveaus een rol. Dit is zichtbaar in de wijze waarop nieuwe gebieden ontstaan. In de Randstad heeft elke ontwikkeling een verbinding met het regionale schaalniveau, terwijl in Bogotá nieuwe ontwikkelingen voornamelijk zijn verbonden met het lokale netwerk. Dit creëert in de Randstad een breuk op lokaal schaalniveau, terwijl het in Bogotá voorkomt dat een daadwerkelijk regionaal netwerk ontstaat. In Bogotá is dit aan het veranderen, want een regionaal netwerk wordt aangelegd boven op al bestaand stedelijk gebied.

Afsluitend zijn de bevindingen uit de casestudies gecorreleerd aan de bestaande studies om algemene conclusies te formuleren. De algemene conclusies zijn dat het hedendaagse stedelijk landschap begrepen kan worden als een structuur die wordt gevormd door overlappende lagen. Elke laag wordt gevormd door gebieden met een gelijke interne samenstelling die verspreid zijn over een gebied. De wijze waarop deze gebieden een laag vormen is door de open ruimte als nieuw verbindend element en door de (grootschalige) infrastructuur. Hierbij bestaat een laag uit repetitieve vormen die verspreid in het gebied liggen en die in eenzelfde manier aan de infrastructuur zijn gerelateerd. Het overlappen van verschillende lagen creëert in sommige gevallen een botsing waaruit tussengebieden ontstaan, deze gebieden hebben een onduidelijk patroon. Deze tussengebieden verschijnen als restgebieden tussen homogene gebieden. Ze bieden een kans voor het ontwerp en de ontwikkeling van een structuur voor het stedelijk landschap op regionaal schaalniveau. Ze zijn gelegen in de overlappende punten tussen verschillende schalen en lagen en combineren kenmerken van de aansluitende gebieden. Ze kunnen nieuwe regionale centra worden en elementen structureren op het regionaal schaalniveau waar de open ruimte het bindend element is.

De traditionele morfologische aanpak concentreert zich voornamelijk op het begrijpen van typologische configuraties en de interne logica van homogene gebieden. Dit onderzoek toont dat het noodzakelijk is om naar de relatie tussen de gebieden te kijken. Het zijn voornamelijk de grenzen waar de homogeniteit breekt en waar de regionale structuur wordt gevormd. Op deze grens bepalen de verbindingen en breuken tussen homogene gebieden de regionale structuur.
Afsluitend, het karteringproces maakt het ons mogelijk om gebieden te begrijpen als overlappende lagen met verschillende logica, waardoor de locatie van de restgebieden of tussenruimten worden onthuld. Deze aanpak faciliteert de studie van de relatie tussen verschillende onderzoekschaalniveaus van een plek in het hedendaagse stedelijk landschap. Het toont de afhankelijk tussen de schaalniveaus en de gevolgen van lokale veranderingen op regionaal niveau en vice versa.

Camila Pinzón Cortes, november 2009
During 5 years I travelled daily between the faculty of architecture at the TU Delft, the building that burned down completely on May 13th 2008, and my home in Delfshaven in Rotterdam. I used the train from Delft South station to Schiedam and from there the metro to Delfshaven station. After my first baby was born, I could not stay late at the faculty like I used to. I needed to be on time to pick her up from the daycare. I walked the route between the faculty and the station Delft South everyday in order to take the stop train at 17:17. Everyday at the same time I took a photo in the same spot.

Today, the building of the faculty does not exist anymore, I do not live in Rotterdam, and this dissertation is finished. These images condense in a silent way everything that happened, in personal terms and in terms of content, around this book between 2003 and 2008.

These photos show a typical site of the contemporary urban landscape, a sort of leftover space or in-between area that many people crosses everyday but nobody has designed. It is the route from a university campus located at the periphery of Delft to the south station of Delft. It is a pedestrian and bicycle path that crosses a small forest along the exit road from the A13 highway and later goes parallel to that road.

The journey is also typical. I never had to visit either the centers of Delft, Schiedam or Rotterdam. I was moving between the peripheries of Delft and Rotterdam through the station of Schiedam, a transit node where I could change from train to metro or bus without leaving the station.

They are a photographic reportage. A form of mapping with the aid of photos that gives account of time, seasons, use of space, and landscape, nature and human intervention together.

They are images manipulated to tell a message. At the same time, they leave space open for interpretations.
During the process of writing of this thesis, the moment when I could thank all the people who helped me to get to this point seemed very far. Finally, I can write this page.

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Camila Pinzón Cortes was born on 1973 in Bogotá, Colombia. In 1997, she graduated as Architect from the National University of Colombia in Bogotá. After her graduation as architect, she worked as designer and researcher in architecture, urban design, and in regional plans. In 2000, thanks to a full scholarship from the Delft University of Technology, she started a master of science in 'Renewal and redesign of city areas' from which she graduated Cum Laude in 2002. Her master graduation project, 'De-fragmenting, urban regeneration in the Santafé neighborhood in Bogotá', received special mention in the 11th IFHP International Student Competition in 2003. After her master degree, she started research in mapping the form of the contemporary city at the Department of Urbanism, section Urban design at the Delft University of Technology. This thesis is the result of that research developed between February 2003 and February 2008. During that period, apart from the research towards the PhD dissertation, she taught diverse courses and supervised graduation projects; she initiated the project 'Urban Panorama' website about the research of Urbanism at Delft, and joined several design competitions. From 2008, she has been busy writing this thesis, developing new research projects, and working for FAST (Foundation for Achieving Seamless Territory). Currently, she works as freelancer architect, urban designer and researcher based in Amsterdam.

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