

**THE INTERSTITIAL SPACES OF URBAN SPRAWL:  
THE PLANNING PROBLEMS AND PROSPECTS – THE  
CASE OF SANTIAGO DE CHILE**

By

**Cristian Alejandro Silva Lovera**

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The Bartlett School of Planning  
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I, Cristian Alejandro Silva Lovera, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

## ABSTRACT

Urban sprawl has been largely discussed as a multifaceted phenomenon mainly driven by the housing debate. Nevertheless, this debate has been strongly determined by the focus on the ‘built-up realm’ leaving aside a crucial less addressed dimension defined by the wide spectrum of undeveloped (or less developed) lands and open tracts. Indeed, these lands determine the fragmented and disperse character of sprawl, and define a parallel unbuilt geography.

Pieces of countryside, farmlands, landfills, brownfields, geographical accidents, speculative lands, infrastructural areas, military facilities, buffers of security and others appear as different but nevertheless as *interstitial spaces* – not clearly considered as ‘urban’ – that take part in suburban transformations. Thus, the emergence of these *interstitial spaces* deserves a closer inspection in order to unveil their origins, role and implications in planning, and to improve the comprehension of urban sprawl and its unbuilt geography. In this vein, this thesis inspects three research questions. First, what are the interstitial spaces of urban sprawl? Second, how they emerge and participate in suburban transformations? and finally, what are their implications in planning? To answer these questions, the thesis develops the concept of ‘interstitial space’ based on a critical revision of current literature, and focused on the different interpretations of institutional actors, their relational character, impacts at different scales and implications in planning.

To do so, the capital city of Chile, Santiago, is used as a context of study. Here, various interstitial spaces are analysed using a mixed methodological approach that implies secondary research, fieldwork that involved 56 semi-structured interviews, site visits, revision of representative documentation and data analysis. Evidence found suggests that interstitial spaces are active components of suburban transformations; they emerge as contested spaces and imply major revisions in planning policies aimed to accommodate population and employment growth.

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## CONTENTS

### **1. INTRODUCTION**

1.1. INTRODUCTION.....	12
1.2. Background and problem statement.....	13
1.3. THE UNBUILT GEOGRAPHY OF SPRAWL AND ITS ELEMENTS .....	15
1.3.1. Defining the unbuilt geography of urban sprawl.....	16
1.3.2. The emergence of the term interstitiality.....	17
1.3.3. The institutional actors determining interstitiality .....	17
1.3.4. The different scales of interstitiality.....	18
1.3.5. The relational character of interstitiality .....	18
1.4. PURPOSE AND OBJECTIVES OF THE RESEARCH .....	19
1.5. METHODOLOGY .....	20
1.6. SANTIAGO DE CHILE AS CONTEXT OF STUDY .....	21
1.7. Selected interstitial spaces.....	22
1.8. STRUCTURE OF THE THESIS .....	22
1.9. KEY FINDINGS AND CONTRIBUTIONS .....	24

### **2. THE UNBUILT GEOGRAPHY OF URBAN SPRAWL**

2.1. INTRODUCTION.....	25
2.2. THE SPRAWL DEBATE AND ITS ABSENCES .....	26
2.2.1. Traditional sprawl and new trends .....	26
2.2.2. New elements in suburbanisation.....	29
2.3. THE UNBUILT GEOGRAPHY OF URBAN SPRAWL.....	32
2.4. THE SCOPE OF THE UNBUILT GEOGRAPHY.....	33
2.4.1. The urbanised countryside.....	34
2.4.2. Inner suburban lands and their ecological contents.....	36
2.4.3. Contiguous expansion .....	39

2.5.	THE NATURE OF THE UNBUILT GEPGRAPHY .....	41
2.5.1.	Determinants of the unbuilt geography .....	42
2.5.2.	Categories of undeveloped lands.....	46
2.5.3.	Natural and intervened undeveloped lands.....	50
2.5.4.	The relevance of undeveloped lands of sprawl .....	52
2.6.	CONCLUSIONS .....	58
<b>3.</b>	<b>INTERSTITIAL SPACES: TOWARDS A FRAMEWORK FOR ANALYSING THE UNBUILT LANDS OF URBAN SPRAWL</b>	
3.1.	INTRODUCTION.....	59
3.2.	BEYOND UNDEVELOPED LANDS.....	59
3.2.1.	Critical antecedents to define the ‘interstitial space’ .....	60
3.3.	DEFINING THE ‘INTERSTITIAL SPACE’ .....	71
3.3.1.	Critical connotations for the ‘interstitial space’ .....	72
3.3.2.	The meaning of ‘interstitial’ .....	77
3.3.3.	The ‘interstitial territory’ and the ‘interstitial spaces’ .....	79
3.4.	THE SCALES OF INTERSTITIALITY.....	81
3.4.1.	Fixing the scale of analysis.....	85
3.5.	THE RELATIONAL CHARACTER OF THE INTERSTICES.....	86
3.5.1.	Spatial aspects of relationality.....	87
3.5.2.	Functional aspects of relationality.....	88
3.6.	CONCLUSIONS .....	89
<b>4.</b>	<b>METHODOLOGY</b>	
4.1.	INTRODUCTION .....	91
4.2.	THE CASE STUDY APPROACH .....	92
4.2.1.	The context of study .....	93
4.2.2.	The interstitial spaces of Santiago’s sprawl .....	96
4.3.	METHODS.....	98
4.3.1.	Documents review .....	99
4.3.2.	Fieldwork.....	99
4.3.3.	Data collection.....	106
4.3.4.	Data analysis.....	108
4.4.	CONCLUSIONS .....	108

<b>5.</b>	<b>THE ORIGINS AND DETERMINANTS OF SANTIAGO'S SPRAWL AND ITS UNBUILT GEOGRAPHY</b>	
5.1.	INTRODUCTION.....	111
5.2.	DETERMINANTS OF SANTIAGO'S SPRAWL .....	111
5.2.1.	Critical factors of Santiago's expansion .....	112
5.3.	DETERMINANTS OF SANTIAGO'S INTERSTICES.....	134
5.3.1.	Critical factors of Santiago's interstices.....	136
5.4.	CONCLUSIONS .....	157
<b>6.</b>	<b>THE DIFFERENT UNDERSTANDINGS, SCALE AND RELATIONALITY OF SANTIAGO'S INTERSTITIAL SPACES</b>	
6.1.	INTRODUCTION.....	159
6.2.	UNDERSTANDING SANTIAGO'S INTERSTICES.....	159
6.2.1.	Definitions and meanings of Santiago's interstices.....	160
6.2.2.	Impacts of Santiago's interstitial spaces.....	166
6.2.3.	Values and potentials of Santiago's interstices .....	171
6.3.	RELEVANT INTERSTITIAL SPACES .....	178
6.4.	REGIONAL AND METROPOLITAN INTERSTICES.....	182
6.4.1.	Metropolitan interstices and interventions .....	182
6.4.2.	Regional interstices and interventions.....	186
6.5.	RELATIONAL CHARACTER OF SANTIAGO'S INTERSTICES .....	187
6.5.1.	Spatial relational interstices.....	187
6.5.2.	Functional relational interstices.....	189
6.6.	CONCLUSIONS .....	190
<b>7.</b>	<b>THE SCALE, RELATIONALITY AND IMPLICATIONS OF INTERSTITIAL SPACES: IN-DEPTH CASE STUDIES</b>	
7.1.	INTRODUCTION.....	192
7.2.	SELECTING CASES.....	192
7.3.	IN-DEPTH CASES STUDIES.....	195
7.3.1.	Analysing by scale .....	196
7.3.1.1.	Cerrillos Airport and infrastructural lands.....	196

7.3.1.2.La Platina .....	206
7.3.1.3.Campus Antumapu .....	214
7.3.1.4.The gravel pits of La Florida .....	219
7.3.2. Analysing by relational character .....	226
7.3.2.1.‘Huertos Obreros y Familiares’ .....	226
7.3.2.2. The military airbase ‘El Bosque’ .....	241
7.3.2.3. Conurbation zones .....	244
7.4. CONCLUSIONS .....	253
<b>8. CONCLUSIONS</b>	
8.1. INTRODUCTION.....	255
8.2. SANTIAGO AS CONTEXT OF ANALYSIS.....	256
8.3. EMPIRICAL FINDINGS: ADDRESSING RESEARCH OBJECTIVES .....	257
8.4. FROM IMPLICATIONS TO CONTRIBUTIONS TO PLANNING .....	260
8.4.1. Understanding interstitiality: what interstices finally are?.....	260
8.4.2. Interstices in policy-making: how they operate in planning?.....	263
8.5. FUTURE AREAS OF RESEARCH .....	270
8.6. CONCLUSIONS .....	272
<b>REFERENCES</b> .....	274
<b>APPENDIX A:</b> List of interviewees .....	314
<b>APPENDIX B:</b> Research questionnaire .....	320
<b>APPENDIX C:</b> Interview sample.....	321
<b>APPENDIX D:</b> Ethical assessment .....	330

## **LIST OF FIGURES**

### **Chapter 1**

**Figure 1:** Research scheme

### **Chapter 2**

**Figure 2:** Janoschka's diagram for Latin American cities

**Figure 3:** Galster's diagram of vacant and undevelopable lands

**Figure 4:** The spectrum of undeveloped lands of urban sprawl

### **Chapter 3**

**Figure 5:** The urbanised territory and the interstitial territory

**Figure 6:** Scales of interstitiality

### **Chapter 4**

**Figure 7:** Area of analysis

**Figure 8:** Santiago the selected interstitial spaces

### **Chapter 5**

**Figure 9:** Santiago and the ZODUC, PDUC and AUDP zones

**Figure 10:** Historical growth of Santiago

**Figure 11:** Distribution of socio-economic groups of Santiago

**Figure 12:** Santiago and location of northern ZODUC zones

**Figure 13:** Santiago and the interstitial spaces

### **Chapter 6**

**Figure 14:** View of an infrastructural interstitial space

**Figure 15:** View of an agricultural interstitial space

**Figure 16:** View of an industrial interstitial space

## Chapter 7

- Figure 17:** Santiago, its interstices and main connectivity
- Figure 18:** Santiago and the Cerrillos Airport site
- Figure 19:** Ciudad Parque Bicentenario (CPB) project
- Figure 20:** View of the Bicentenary Park
- Figure 21:** Santiago and La Platina site
- Figure 22:** South Park proposal
- Figure 23:** View of La Platina site
- Figure 24:** Campus Antumapu site and surroundings
- Figure 25:** View of Campus Antumapu site
- Figure 26:** Campus Antumapu plans
- Figure 27:** Santiago and the gravel pits of La Florida
- Figure 28:** View of a gravel pit of La Florida
- Figure 29:** View of the gravel pit site of Maipú
- Figure 30:** Santiago and the Worker and Familiar Orchards
- Figure 31:** View of the daily life of an Orchards
- Figure 32:** Santiago and the military airbase El Bosque
- Figure 33:** Santiago and conurbation zones
- Figure 34:** View of a Maipú-Padre Hurtado conurbation space
- Figure 35:** View of a Santiago-San Bernardo conurbation space

## Chapter 8

- Figure 36:** Architectonic study of the interstitial spaces

## LIST OF TABLES

- Table 1:** Natural and intervened undeveloped lands (Chapter 2)
- Table 2:** Interstitial spaces and their relational character (Chapter 3)
- Table 3:** Selected study cases (Chapter 4)
- Table 4:** N° of Interviews, informants and subject areas (Chapter 4)
- Table 5:** Number of plots, sizes and population of Worker and Familiar Orchards (Chapter 7)

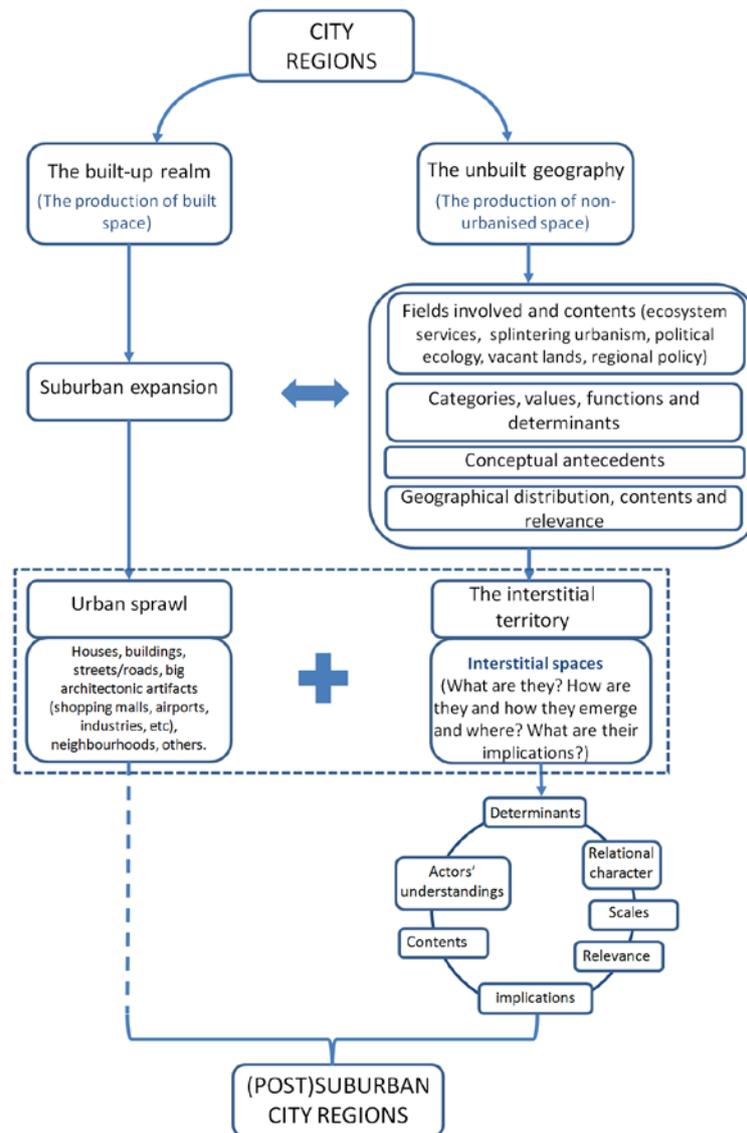
## 1. INTRODUCTION

### 1.1 INTRODUCTION

This research inspects the interstitial spaces of urban sprawl, understood as the spectrum of elements that compose the unbuilt suburban geography. These interstices are defined by a series of empty, undeveloped, less developed or inert spaces – that coexist with the (sub)urbanisation – that appear as apparently random by-products of the fragmented expansion. Elements such as pieces of countryside, military and industrial facilities, vacant lands, geographical accidents, restriction areas and buffers of security, infrastructural and abandoned lands inter alia are all configuring an interstitial territory currently omitted from the literature or at least observed as a less addressed dimension of urban sprawl.

However, in a closer inspection the interstices of sprawl emerge as active and dynamic elements, and influence planning at different levels. They are still unexplored – only partly explained from a long-standing focus on the built-up space – and disclose several implications in planning and potentials for improving the comprehension of urban sprawl and its unbuilt geography.

So, assuming the ‘built-up focus’ of much of the extant literature as a constraint on our understanding of the urbanization process, this research considers the literature on (sub)urbanisation but also that on political ecology, ecosystem services, splintering urbanism, vacant lands, green infrastructure and urban agriculture and regional planning to provide a more comprehensive framework for understanding urban sprawl but particularly its unbuilt geography and the elements that are part of. So, this research posits that urban sprawl is not only a matter of built-up lands but also interstitial spaces that deserve a deeper inspection in order to improve the comprehension of planning policies and the expansive development of city-regions (Figure 01).



**Figure 1:** The research pathway. Urban sprawl emerges as formed by built-up and interstitial spaces (author's diagram).

### 1.1.1 Background and problem statement

Urban sprawl has been widely discussed as a pattern of urban development mainly driven by the housing debate and characterised by scattered urbanisation, highly criticised for its socio-environmental, economic and political impacts (Gillham, 2002; Soule, 2006; Ewing, et al., 2002; Torrens, 2006; Barnes, et al., 2001; Jaret, et al., 2009). However, and aside from critics, urban sprawl is also seen as expression of economic growth and currently defined by increasing patterns of polycentricism, multi-functionality, social diversity and functional self-sufficiency (Heinrichs, et al., 2011; Phelps, 2012; Gunnar and Inger-Lise, 2011; Faludi, 2005; Gallent and Shaw, 2007).

Despite the long-standing research on urban sprawl, there is still a lack of attention paid to its unbuilt geography determined by the series of undeveloped lands and open tracts that emerge as gaps – named here as ‘interstitial spaces’ – that are physically embedded but excluded from planning and politics. Apart from the fact that the interstices define the fragmented nature of sprawl, they emerge as somehow unplanned, undetermined, ambiguous or as the outcome of less controlled processes in planning. Indeed, they hardly gain a mention in the literature – except with regard to their instrumental character, their inert condition or as reclaimed lands to be urbanised. They remain as undefined elements in the understanding of sprawl (Gillham, 2002; Yeh and Li, 1998; Siedentop and Fina, 2010; Galster, et.al., 2001). More specifically, different expressions of interstitiality appear as instrumental (Galster, et al., 2001; Siedentop and Fina, 2010; Barnes, et al., 2001), as unexplored ecosystem services (Galland and Enemark, 2012; Sandström, 2002; Van Leeuwen and Nijkamp, 2006; Laforteza et al., 2013; La Rosa and Privitera, 2013), or simply as vacant lands that influence the land market in different ways (Meyer-Cech and Seher, 2013; Thomas and Littlewood, 2010; Clawson, 1962).

But a deeper inspection of suburban interstices unveils them as more active elements, as engaged spaces in suburban transformations at different levels. In Matos’ words, ‘when one penetrates the system of interstitial spaces and starts to explore it, one realises that what has been called ‘empty’ is not so empty after all. Instead, it contains a wide range of uses’ (Matos, 2009: 66). Indeed, some interstitial spaces are identified as relevant precisely by their functions and impacts, but also for what they mean in triggering suburban transformations at different scales. It is noticed, for instance, that some interstices are well-located, have good land capacity or connect several separated territorial units articulating different institutional interests. Whatever the case, the interstitial spaces of urban sprawl remain something of an absence in the urban studies literature and so this research proposes to deepen an analysis of them and provide evidence of their implications for planning.

## 1.2 THE UNBUILT GEOGRAPHY OF URBAN SPRAWL: DEFINING INTERSTITIAL SPACES

The variety of interstitial spaces embraced in suburbanisation make their definition complex and conceptually intricate. Pieces of countryside, farmlands, woodlands, geographical restrictions, brownfields, landfills, forest lands, green corridors, protected ecosystems, buffers of security, military and industrial facilities, abandoned spaces, large-scale venues, conurbation zones, historical areas, speculative lands and others, constitute a varied spectrum of interstices that evince different levels of activity, impact and potentials and thus, implications in planning.

Yet interstitial spaces do not appear as mere by-products of the scattered expansion. First, market constraints stimulate discontinuous urban encroachments on rural lands that leave many open tracts between consolidated areas and outer developments (Holcombe, 1999; Clawson, 1962). This situation is also stimulated by socio-cultural factors related to the 'suburban dream' (Phelps, et al., 2010; Gunnar and Inger-Lise, 2011) and somehow considered in plans for future growth, reactivated through the land-market or regarded as social benefits (Harvey and Works, 2002; Talen, 2010). These antecedents suggest that interstitial spaces represent clear institutional interests despite their apparently random presence.

In terms contents, interstitial spaces have different locations, scales and levels of relationality. In particular, interstices distributed in fringe/belt areas are characterised by a hybrid urban/rural condition (Sieverts, 2003; Gallent and Shaw, 2007; Van Leeuwen and Nijkamp 2006). Inner interstices illustrate ecological contents and connect fringes and consolidated zones (Laforteza et al., 2009; La Greca et al., 2011; Sandröm, 2002), and expansion areas are for continuous growth and valued for their locations and land capacity (Banerjee, et al., 2012; Cervero, 2003; Bruinsma, et al., 1993). All in all, the scales that better describe suburban interstitiality are the metropolitan and regional, and their spatial and functional characteristics determine their different degrees of integration.

### 1.2.1 Defining the unbuilt geography of urban sprawl

A first empirical approach to defining urban interstices might be based on their functions and points them out as infrastructural, derelict, agricultural, public facilities, green spaces, protected ecosystems, buffers of security, historical zones, industrial and military installations, boundary areas and as financial commodities (Wandl, 2012; Afla and Reza, 2012; Li, et al., 2014; Ponzini and Vani, 2014; O’Callaghan and Lawton, 2016). In a similar vein and more conceptually, some terms have emerged to define the ‘in-between space’ (Sieverts, 2003; 2011), ‘vacant lands’ (Northam, 1971; Foo, et al., 2013), ‘undeveloped lands’ (Zhang, et al., 2012), ‘open tracts’ (Gillham, 2002), ‘non-places’ (Auge, 1995), ‘terrain vague’ (De Solá-Morales, 2002; Mariani and Barron, 2014), ‘interfragmentary spaces’ (Vidal, 2002), ‘non-urbanized areas’ (La Rosa and Privitera, 2013; La Greca, et al., 2011), ‘Wildscapes’ (Jorgensen and Keenan, 2012), the ‘Drosscape’ (Berger, 2007), ‘wastelands’ (Gandy, 2013). Each of these various terms are often specific to certain types of interstitiality or simply partial – even contradictory – and not necessarily posited as a dimension of urban sprawl.

The terms ‘urban interstices’ (Jorgensen and Tylecote, 2007; Brighenti, 2013) and ‘interstitial landscapes’ (Gandy, 2011; Sousa Matus, 2014) have rarely been used and remain under-developed. It is therefore the task of this thesis to better develop and specify the term ‘interstitial’ with regard to processes of urbanisation. The ‘*interstitial space*’ is proposed here as an embracing and conceptually generic term that allows operationalising the analysis of any of the elements of the unbuilt suburban geography and to refer to their more active condition which influences the suburban transformation, and highlight their implications in planning.

If the lack of attention on the interstices of suburbanization has analytical implications for our comprehension of urban sprawl, what is clear is that the implications for planning have also rarely been considered. This is important since it is clear that planning systems rarely have the appropriate tools to address this unbuilt geography.

### **1.2.2 The emergence of the term interstitiality**

In planning, the term interstitiality has been hardly used and mainly to describe suburban aspects in the sense of accidents or ‘gaps’ (Mohammadi et al. 2012; Gallent and Shaw, 2007; Gandy, 2011). Gandy (2011), for instance, uses the term to describe abandoned spaces with still unexplored ecological and aesthetic contents. Jorgensen and Tylecote (2007) assume that ‘urban interstices’ exist as spaces for wildlife (or ‘wildscapes’). Brighenti (2013) refers to marginalised spaces as expressions of institutional gaps, often occupied by marginalised groups (Brighenti, 2013). Dovey (2012) refers to informal practices in urban ‘interstices’ and Tonnelat (2008) describes ‘interstices’ as transitional spaces in which immigrants are integrated into society. More closely related to the suburban space, Sousa Matos (2009) uses the term ‘interstitial space’ to describe marginal suburban areas but only focused on their potentials for urban design and architectonic innovations.

More conceptually speaking, the term ‘interstice’ is used to describe spatial, physical or temporary ‘in-between’ or ‘out of the norm’ situations. It assumes the presence of ‘surroundings’ and thus, an ‘interstice’ is a context-dependent element with reciprocal influence on its environment. This condition can be defined by the scale at which the interstice is manifested – which in turn determines different impacts and its relational character – i.e. the degree of integration with built lands – and, thus, its condition as an independent entity or as imbricated with its context. It is necessary to clarify that the smallest and largest scales of interstitiality are not considered in this research as they contribute little to an understanding of urban sprawl. Nevertheless, these scales are mentioned to clarify the range in which interstitiality can be manifested.

### **1.2.3 The institutional actors determining interstitiality**

The appearance of interstitial spaces is related to different interlinked determinants – closely connected to those that also explain urban sprawl – that rely on a series of institutional actors and representations of different interests. On the one hand, these determinants are tied to regulatory frameworks and planning tools aimed to control suburbanisation but that

paradoxically trigger fragmented growth such as the ‘urban limit’, institutional attributions (central/local) in housing policies, master plans and financial instruments to stimulate the land market. On the other hand, a series of absences in planning also trigger the presence of interstices as *de facto* situations determined by diverse disparities between regional and metropolitan regulations, lack of stimulus in regeneration policies, institutional superposition and fragmentation, and technical constraints in regulating undefined lands.

#### **1.2.4 The different scales of interstitiality**

A first scale of interstitiality corresponds to small spaces between buildings, named here as ‘*the scale of proximity*’. A second scale corresponds to ‘*urban interstices*’ found in traditional suburbs and generally intended for residential growth. A third scale corresponds to ‘*metropolitan interstices*’ that describe larger spaces placed among different administrative districts. A fourth scale is the ‘*regional interstice*’ placed between different cities characterised by agricultural, industrial and natural landscapes. Finally, large non-urbanized areas between city-regions define the ‘*interstice of remoteness*’ that usually depends on national (or even international) regulations. Each scale has its own dynamics of transformations. In this research, the *metropolitan* and *regional* scales will be analysed as the most appropriate to a better understanding of urban sprawl and its interstitiality.

#### **1.2.5 The relational character of interstitiality**

As mentioned, interstitial spaces are context-dependent elements and have different degrees of relationality that affect their integration with neighbouring built-up lands. This relationality depends on their spatial and functional aspects and defines them as totally open and integrated elements or as closed environments with a narrowed relational character. This relationality is analysed in this research from cases that show high, low and mixed levels of integration.

#### ***Summary***

The ‘interstitial space’ emerges as a single and appropriate conceptual frame to embrace a multitude of other relevant terms that describe the unbuilt

geography of urban sprawl and their different expressions. The main themes that I focus on in this thesis and explore empirically are: the institutional actors as determinants in the appearance of interstitial spaces; the different scales at which interstitial spaces can emerge, and; the importance of appreciating the relational properties of interstitial spaces.

### **1.3 PURPOSE AND OBJECTIVES OF THE RESEARCH**

Aside from reinforcing the idea that urban sprawl is not only a matter of built-up areas but also ‘interstitial spaces’, this research aims to disclose their origins, role and implications in planning.

Based on empirical findings, it is possible to assert that ‘interstitial spaces’ are not inert elements but rather active components of suburbanisation. They are not matter of consensus in their understanding and progression to become urbanised. These spaces are also usually placed outside urban policies but at the same time spatially embedded, coexisting with (sub)urbanised surroundings. Apart from their morphological diversity, at regional and metropolitan scales they appear as multi-boundary lands and as contested spaces among differing institutional interests, opening questions related to their physical, political, economic and social coexistences at different levels. There is enough evidence to suggest that although interstitial spaces appear as somehow random outcomes of suburbanisation, they rely on clear determinants and institutional purposes that explain their different expressions and implications.

So, the purpose of this research is to argue that the unbuilt geography of urban sprawl is not inert at all. Indeed, it is composed by a series of ‘interstitial spaces’ that emerge as active elements in suburbanisation that clearly contribute in expanding the debate beyond the ‘the built-up realm’. Although they remain unexplored, unprecise, ambiguous or undetermined, the ‘interstice’ as umbrella term allows operationalising their analysis and their role in the overall efficacy of suburbanization processes and planning policies.

Using as a context of study the capital city of Chile, Santiago, in this research different interstices are analysed to determine to what extent they emerge as another component of urban sprawl and how they impact on planning. Three main research objectives are identified:

- (1) To develop the concept of ‘interstitial space’ based on insights from the extant literature. In particular, to consider the different understandings operating upon, the different scales, and the relational properties of these spaces;
- (2) To provide an empirical examination of interstitial spaces in the urban sprawl in Santiago de Chile in terms of:
  - (a) The understandings of key actors about the interstitial spaces;
  - (b) The determinants, nature, impact and values of interstices at metropolitan and regional interstitial scales;
  - (c) To analyse the relational contents and aspects of interstitial spaces and their impacts on their surroundings;
- (3) To disclose the implications of interstitial spaces for planning.

Objective (1) is addressed in chapters 2 and 3 as part of the theoretical debate on urban sprawl and interstitial spaces. Chapters 5, 6, and 7 provide empirical data for objective (2). They disclose the determinants of and actors involved in, and analyse scale and relationality of interstitial spaces. The planning implications of interstices (3), are empirically developed in chapter 7 and explored in general terms in chapter 8.

### 1.4 METHODOLOGY

The methodology combines qualitative and quantitative approaches. It involves documentary review, fieldwork, data collection, analysis, conclusions and further research areas.

Considering that interstitial spaces are varied, several cases were selected to cover a wide range of categories – and to allow combining generalisations based on Flyvbjerg (2006) and Burawoy (1991) suggestions on the weaknesses or strengths of a unique or multi-study case approach in contributing to general knowledge (Flyvbjerg; 2006; Burawoy, 1991) – and

to explore the different implications of metropolitan and regional interstitiality.

Regarding documentary review, this considers secondary data, physical and virtual records, institutional reports, plans and norms, regulations and laws, planning and urban design proposals, statistical data and news directly related to the cases.

Fieldwork implied site visits and visual records of selected areas, updating of maps and data, and 56 semi-structured interviews with key actors. Interviews were conducted in Chile and the UK in 2014, achieving a balanced array of actors that includes politicians, policy-makers and technicians, public agencies, planning officials, architects and private consultants, developers and business groups, residents and community representatives, socio-environmental organisations and NGOs, all selected for their first-hand knowledge on urban policy and selected cases.

Site visits were also made in 2014 and focused on pre-selected cases. This provided information regarding the spatial composition, state of physical infrastructure, accessibility and levels of maintenance of particular examples of interstitial spaces. Specifically, seven interstitial areas were selected to cover the different categories of interstitiality described in the theoretical framework.

Data analysis implied the revision of data collected (notably institutional records and secondary research), transcriptions and content-analysis of semi-structured interviews, corroboration with secondary data and visual records and statistics.

### **1.5 SANTIAGO DE CHILE AS CONTEXT OF STUDY**

This research uses the capital city of Chile, Santiago, to analyse its interstitial spaces. Santiago is a clear example of Latin American sprawl that shows one of the highest rates of traditional suburbanisation with embryonic patterns of polycentricity mainly defined by commercial services and regional fragmentation (Heinrichs, et al., 201; Inostroza, et al., 2013). In this

context, several interstices take place as part of the intrinsic fragmentation of the suburban space.

For several authors and policy makers, Santiago's sprawl is determined by a highly centralised planning system – mainly driven by the Ministry of Housing and Urbanisation (MINVU) – that allows the creation of outer developments on peri-urban lands. This (sub)urbanisation is land-market dependent but also tied to a strong housing policy and planning tools paradoxically aimed to regulate the expansion (Tapia, 2011; Ducci, 1997; Hidalgo, 2007; López, 1981; Peterman, 2006). Here, a diverse range of interstices emerges at different scales and with different levels of integration, which provide enough evidence about their origins, contents and impacts in the suburban performance and planning.

In particular, the southern area of Santiago is specifically analysed regarding its interstitiality as it concentrates the most relevant interstices covering a wider range of categories – including conurbations, undeveloped, derelict, industrial and agricultural lands – and different aspects of relationality.

### **1.5.1 Selected interstitial spaces**

As mentioned, Santiago's interstices embrace a wide range of categories identified in the literature (Wandl, 2012) and with different impacts and modes of integration (Ducci and González, 2006). These interstices are distributed from fringe/belt areas to inner suburbs – many of them well located – and considered as relevant by different actors due to their potentials for changing current suburban inertias. Specifically, 7 cases are selected that provide enough evidence of their relevance, implications of their geographical scales and the different aspects that determine their relational character as more or less (des)integrated environments.

## **1.6 STRUCTURE OF THE THESIS**

The thesis is arranged in eight chapters. This present chapter has introduced the research and its scope. The next two chapters address the theoretical debate related to urban sprawl and the interstitial spaces. The next chapter describes the methodological skeleton of the research. Then, there are three

chapters in which the empirical analysis is presented, and finally a chapter of conclusions and future research areas.

More specifically, chapter two provides a critical review on urban sprawl and its current trends, as well as the origins, role, values and implications of undeveloped lands and open tracts. It concludes that urban sprawl is a matter of built-up spaces and undeveloped lands that deserve a deeper inspection to provide a more comprehensive perspective of sprawl and its unbuilt geography.

Chapter three proposes the ‘interstitial space’ as a theoretical framework for understanding the elements of the unbuilt suburban geography. It is argued that suburban interstices are not inert lands but rather dynamic elements with different degrees of activity. This chapter develops in detail the idea of ‘interstice’ as a suitable framework to understand sprawl itself and its ‘out of the norm’ and in-between elements. This chapter also describes the geographical scales and the relational character of interstitiality

Chapter four describes the methods used in this study. It also describes instrumental aspects, the study case approach, the context of study, and the criteria to select the cases to be analysed. It also exposes the research questions and objectives, limitations and explains how collected data is processed.

Chapter five is the first empirical chapter and explains Santiago’s sprawl and its suburban interstices. It describes the constraints of the Chilean planning system in promoting urban sprawl and the appearance of interstitial spaces. It argues that Santiago’s suburban sprawl and interstices are related – inseparable elements of the same processes.

Chapter six is the second empirical chapter focused on Santiago’s interstices. It illustrates the understanding and values of these spaces for different actors, relevance, interventions and how they influence the urban agenda regarding their scale and relational character.

Chapter seven is the third and final empirical chapter. It exposes the analysis of the selected study cases scrutinising their origins, values and implications in planning. These cases are selected by their relevance and functional categories, sorted by their scales and relational character, and provide enough empirical evidence to address the research questions and aims.

Chapter eight provides conclusions and future research topics. In this chapter, findings are reviewed in accordance to the theoretical framework and research questions and objectives. Implications of interstitial spaces are commented upon – in theoretical and empirical terms – and discussed in consideration of research constraints and further research areas.

### **1.7 KEY FINDINGS AND CONTRIBUTIONS**

The research clearly demonstrates that urban sprawl is a dual phenomenon formed by built-up spaces *and* interstices that are active elements in suburbanisation and impact on planning at different levels. In conceptual terms, it provides a theoretical frame – ‘the interstitial space’. Although hardly used in planning, this term provides the means to operationalise an analysis of any element of the unbuilt suburban geography. More empirically, the research discloses the series of contents that illustrate the multifaceted and dynamic nature of suburban interstices, and how they influence suburban transformations and planning policies. Specifically, Santiago’s interstices reveal the different determinants, connotations and impacts derived from the scales in which they are manifested, and the different spatial, functional and institutional aspects that define their relational character. Although for some they represent territories of opportunities, for others the interstices are socio-spatial barriers with negative connotations. In a similar vein, they emerge as spaces of non-consensus among differing institutional interests and as closed or open environment regarding surroundings and planning policies. All in all, Santiago’s interstices make evident the project-based rationale in institutional interventions and the series of political perils derived from the absences of current planning mechanisms mainly adjusted to promote suburban expansion.

## 2. THE UNBUILT GEOGRAPHY OF URBAN SPRAWL

### 2.1 INTRODUCTION

The debate on urban sprawl has been mainly addressed by two bodies of literature. First, urban sprawl is often associated with economic growth after World War II and defined by residential and commercial services connected by roads. Second, it is described as a more dynamic process of suburbanisation – still characterised by spatial fragmentation – with emerging patterns of polycentricity, multi-functionality and functional self-sufficiency in economic, social and political terms. Despite detailed differences, between these bodies of literature, their common ground is their focus on ‘urbanisation’ as synonym of planning the built-up space. This tradition consequently has resulted in a lack of attention to fragmentation as context consisting of a wide spectrum of undeveloped lands. Nevertheless this, urban sprawl can hardly be considered without reference to these undeveloped, empty, less-developed or underdeveloped lands. When these undeveloped lands are discussed they still appear as ambiguous, undefined, partially defined or simply referred to a somehow inert dimension with minor influences on suburbanisation processes and their associated planning and politics.

The unbuilt geography of sprawl is composed of a wide spectrum of undeveloped lands with different characteristics, origins, functions, potentials and implications. It embraces geographical restrictions and open spaces to industrial and commercial facilities, brownfields, landfills, farmlands, forest lands, green corridors, public spaces, speculative areas, buffers of security, protected ecosystems, conurbation zones, military facilities, research centres, railways lines, infrastructural spaces and others at different locations, geographical scales and levels of (des)integration that suggests a complex scope of study beyond the residential debate.

In this chapter, the research synthesizes the views on urban sprawl and new trends of suburbanisation to highlight the fact that although there are advances on this debate there is still a lack of attention on the unbuilt suburban geography and its elements, despite consideration of some

instrumental aspects and still ambiguous – and even contradictory – definitions.

## 2.2 THE SPRAWL DEBATE AND ITS ABSENCES

The literature on urban sprawl is vast and provides a range of perspectives to inspect the phenomenon. As concept, it apparently started in the 1940's (Gillham, 2002) to describe large and scattered suburbanisation. But the understanding of 'urban growth' as 'sprawl' seems to follow two streams of arguments. First, the idea of dispersed growth coined in the 40s to describe American suburbanisation driven by the increasing use of private cars and the expansion of the interstate motorway system (Gillham, 2002; Soule, 2006), and secondly, the increasing desire to living near the countryside as synonym of well-being. It is identified as the 'suburban condition', closely related to sprawling patterns of urban growth (Hess, et al., 2001). In this debate, however, a dimension that is almost unattended is the unbuilt space that precisely characterises this suburbanisation as an environment supplied by generous green areas, wider spaces and proximity to the countryside.

### 2.2.1 Traditional sprawl and new trends

Urban sprawl has been largely characterised by the presence of low-density residential neighbourhoods, regional transport infrastructure, car-dependency, single land-uses and lack of physical continuity (Gillham, 2002; Soule, 2006; Peiser, 2001; Ewing, et al., 2002; Torrens, 2006; Barnes, et al., 2001; Schmidt, 1998; Jaret, et al., 2009). This description mainly refers to North American suburbanisation (Charmes and Keil, 2015), Latin America and the southern hemisphere, China and others contexts with large-scale residential developments (Inostroza, et al., 2013; Qian, 2012). This description of urban sprawl is criticised due to the environmental, social and economic impacts, and its focus on the housing debate (Gallent and Shaw, 2007; Thomas, 2001).

Nevertheless, for some authors the aforementioned elements are not enough to signalise any form of urban growth as 'sprawl' as there are more factors that depict suburbanisation processes such as land-use conversion, population change, traffic and vehicle miles travelled, energy consumption,

and fiscal measures (Nelson, 1999). In addition, more technical studies suggest that a set of indicators are necessary to determine ‘the sprawl index’ to then effectively label an area as in a sprawling condition (Galster, et al., 2001). Also, more contemporary views on urban sprawl define new elements that consider the evolution of single land-uses towards more multi-functional environments. These views allow the suburban landscape to be identified as a space of transition – rather than a mere residential extension of the city – between the consolidated city and the open countryside. In this vein, Sieverts (2003), describes urban sprawl as an ‘in-between’ territory (*Zwischenstadt*) configured as a patchwork of built-up areas interspersed with rural tracts (Sieverts, 2003). In addition, and regarding the evolution of suburbia, Phelps (2011) and Heinrichs (2011) argue that increasing functional self-sufficiency determines ‘(post)suburban’ patterns of development characterised by a certain degree of disconnection from traditional urban centres and concentration of employment (Phelps, 2011; Heinrichs, et al., 2011).

Despite this evolution, urban sprawl still appears as reflection of advanced capitalist processes in which market trends, asymmetric relations between institutional actors and delayed planning reactions leave planning policies of control behind *de facto* situations and depending on particular leadership capacities in a context of differing interests that exceed the supremacy of technical solutions or macro-scale plans (Kombe, 2005; Phelps, 2012). Apart from this political dimension, the evolution of suburbia towards more multi-functional suburban environments is apparent:

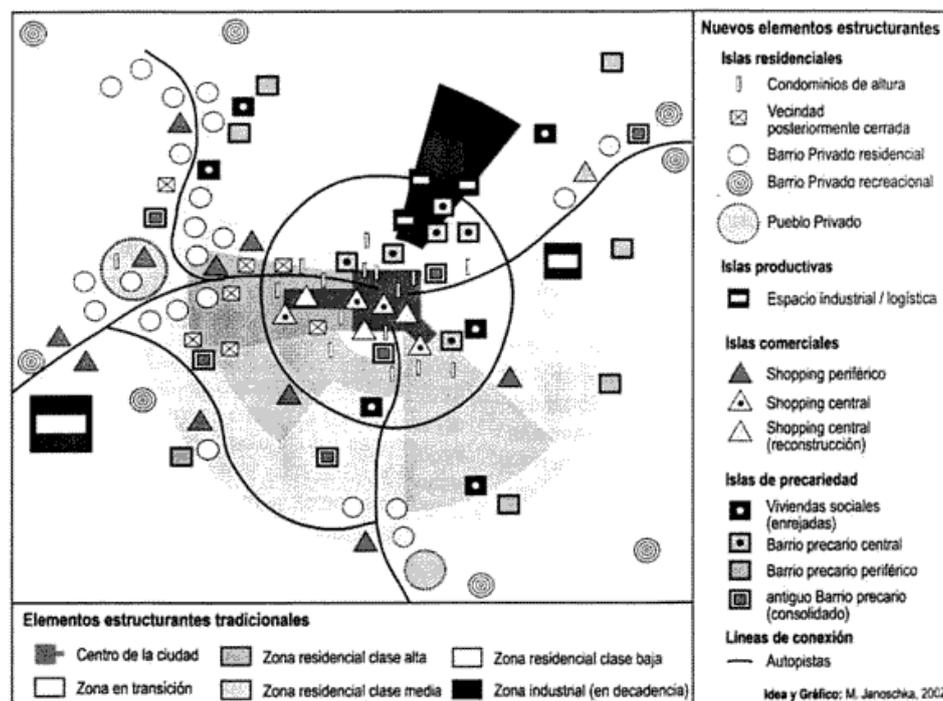
‘Since their creation, the suburbs have been evolving and changing. From bedroom communities to edge cities, the trend has been toward more complex and complete places’ (Calthorpe and Fulton, 2001: 198).

Urban sprawl is also understood a matter of ‘degree’ in which different factors are considered. Some argue that it is difficult to identify sprawl only by density, unless a longitudinal perspective is taken (Hess, et al., 2001; Galster, et al., 2001). In Hess’s words

‘It is the trend in population density, rather than current population density, that determines whether a city is sprawling or not. A city becoming less densely

populated through time is said to be sprawling, even if it is currently quite densely populated in comparison to other cities' (Hess, et al., 2001: 6).

But as part of the common ground in defining sprawl, physical fragmentation is also pointed to as the relevant factor. Indeed, this is the most direct characteristic that somehow entails the relevance of undeveloped lands as another dimension to be considered. It is argued that suburban sprawl is composed of 'fragments' – that could be physically, economic and socially diverse – and undeveloped lands. So, fragmentation suggests a more diverse territory composed by different functional 'islands' – such as residential neighbourhoods, big architectonic artefacts (malls, supermarkets, airports, retail facilities), industrial zones, historical protected areas, entrepreneurial districts – and undeveloped lands that support transport networks as part of a complex processes of urban production that involves geographical, social, economic, political and spatial dimensions (Janoschka, 2002; Link, 2008; Cariola and Lacabana, 2001; Velt, 1996; De Mattos, 2002; Bayón, 2013; Dammert, 2004; Vidal, 1999; 2002; Irwin and Bockstael, 2007; Leontidou and Couch, 2007) as depicted for example in Figure 2 for the Latin American city.



Fuente: Janoschka (2002b), modificado.

**Figure 2.** Janoschka's diagram for Latin American cities defined by several sub-centres, diverse urbanised areas and land uses (Janoschka, 2002b)

### 2.2.2 New elements in suburbanisation

The aforementioned notion of urban sprawl as composed by separated fragments connected by roads and single land uses still depicts processes of suburbanisation in several latitudes (Bruinsma, et al., 1993; Bruinsma and Rietveld, 1993; Cervero, 2003; Graham, 2000). It is seen as the most common pattern in almost all cities assuming that critical conditions of developing economies define financial and political constraints that restrain the urban development towards different expressions of suburbanization (Inostroza, et al., 2013). However, the debate on sprawl is still also influenced by different understandings on closely related terms in which ‘suburbanisation’ and ‘suburbanism’ scrutinise physical/spatial aspects and socio-culturally accepted norms of suburban life, including their different modes of organisation and governance, and the scales of impact of different city-regions (Ekers, et al., 2012). In a different vein, ‘gigantism’, ‘megacities’ and other terms describe these heavily urbanised areas mostly determined by their physically endless traditional suburbia, their different expressions of social segregation and financial constraints in supplying services and infrastructure that finally aggravate environmental and social problems (Kraas and Mertins, 2014; Angotti, 2013; Coy and Pöhler, 2002). In these contexts, undeveloped lands and open tracts used to emerge as derelict spaces, abandoned areas or industrial lands with clear signs of deterioration (Mohammadi, et al., 2012; Polidoro, 2011; Sabri, 2008; Schulze, 2010).

In other cases and somehow linked to advanced economies, suburban sprawl illustrates emerging patterns of ‘polycentricity’ (Van Oort, et al., 2010; Lambregts and Zonneveld, 2004; Kloosterman, and Lambregts, 2001), ‘multi-functionality’ (Burger and Meijers, 2012; Salet and Woltjer, 2009; Gallent and Shaw, 2007; Faludi and Van Der Valk, 1996; Fazal, Geertman and Toppen, 2012), functional self-sufficiency (Charmes and Keil, 2015; Phelps, 2012; Phelps and Wood, 2011; Phelps, Wood and Valler, 2010), and implementation of ‘smart-growth’ policies with different modes of institutional coordination (Girling, 2010; Gruby and Basurto, 2013; Stigt, Driessen and Spit, 2013; Sutherland, et al., 2012). The aforementioned appeared as reaction against impacts of massive mono-functional sprawl in

which undeveloped lands and open tracts emerge as more defined lands – still with certain degree of integration or functionality – and with more positive connotations (Faludi, 2005; Faludi, et al., 1996).

Specifically, ‘polycentricity’ depicts suburbia as composed by several sub-centres that articulate fringes with the main city’s and other suburban areas. Here, undeveloped lands are part of polycentric functionalities or seen as future sub-centres. Although the concept is still under revision (Gruby and Basurto, 2013; Burger and Meijers, 2011) it is commonly used as counterpoint for traditional monocentricity in which suburban undeveloped lands are seen as residual. However, ‘polycentricity’ distinguishes between morphological and functional approaches and also different levels of ‘gravity’ and ‘centrality’ (Burger and Meijers, 2011) assuming undeveloped lands as both flexible morphological and functional elements. This concept describes urban sprawl as composed by independent parts that can almost work by themselves (Burger and Meijers, 2011; Kloosterman and Lambregts, 2001; Salet and Woltjer, 2009; Lambregts and Zonneveld, 2004; Van Oort Burger and Raspe, 2010), or as constellations of ‘peri-centres’ that can even be more efficient and interdependent (Salet and Woltjer, 2009) in comparison to traditional cores. In Qian and Wong’s words:

‘It is argued by some (...) that polycentric development is more efficient and sustainable than compact and monocentric development when an urban area achieves a certain size, with reasonable proximity and functional independence between centres’ (Qian and Wong, 2012: 405).

In a similar vein, ‘multi-functionality’ refers to an area that holds several activities - a condition that it is possible to find in fringe/belt areas (Gallent and Shaw, 2007; Burger and Meijers, 2012; Salet and Woltjer, 2009; Faludi and Van Der Valk, 1996; Fazal, et al., 2012). The term multi-functionality also includes the presence of agricultural and industrial lands and thus, assumes less developed lands as part of the multifunctional aspects. According to Gallent and Shaw (2007), urban fringes are complex environments because of their random assemblage of shapes, former industrial functions, polluted lands, geographical accidents, bulk-retail, degraded farmlands, large recreational areas, fragmented residential developments and transitional lands for trips and temporary activities. This

complexity – in which undeveloped lands are included – defines a diverse territory for experimentations and alternative political proposals beyond the bi-dimensional conception of ‘land-use’ (Gallent and Shaw, 2007).

Concurrently to these ideas, the notion of suburbia as a parallel ‘minicity’, refers to their high levels of diversity and multi-functionality, linked to the city but highly self-sufficient (Gunnar and Inger-Lise, 2011). Here, unbuilt suburban spaces between the city and the ‘minicity’ are clearly defined for temporary uses or functions such as squares and parks. Suburban ‘minicities’ support residences but also workplaces, different morphological patterns, levels of density, housing models, public services, different modes of transport and flexibility to provide adaptations over time that includes the integration of open tracts. According to Gunnar and Inger-Lise (2011), there is enough empirical evidence to assert that due to the integration of built and unbuilt spaces, some suburban landscapes are potentially better environments with comparatively higher indicators of urban quality (Gunnar and Inger-Lise, 2011).

‘Smart-growth’ also appears to address impacts of uncontrolled sprawl supported by well-defined open spaces and high urban standards. It is based on a series of premises that include successful planning practices and insights on environmental sustainability, connectivity and social integration in which open spaces have a relevant role. According to Girling (2010) ‘smart-growth’ aims to improve the suburban quality via the provision of well-defined open spaces that contribute in spatial and physical heterogeneity, diverse and flexible land-uses and biodiversity, but also the general improvement of environmental policies (Girling, 2010; Stigt, et al., 2013; Sutherland, et al., 2012).

‘Urban sprawl’ is still under debate and its fragmentation provides valuable insights on the unbuilt suburban geography and its elements. In this light and notwithstanding the predominant focus on the built-up space, the literature on urban sprawl also unveils the potential of undeveloped lands and open tracts. In other less controlled cases, this potential has been described as a by-product of ‘splintering urbanism’ and infrastructural lands

(Graham and Marvin, 2001) in which new expressions of urban agriculture and ecosystem services have taken place. However, these spaces are generally still undefined, ungoverned, inert, restricted or non-integrated and thus, still deserve a deeper understanding and analysis (Graham and Marvin, 2001; Gallent, 2007; Sieverts, 2003; Hamers and Piek, 2012; Meyer-Cech and Seher, 2013).

### 2.3 THE UNBUILT GEOGRAPHY OF URBAN SPRAWL

The understanding of urban sprawl as a fragmented environment confirms the implicit presence of its unbuilt geography and the elements that are part of it. This fragmentation defines sprawl itself as a still undefined or ambiguous territory – neither absolutely urban nor rural – precisely by the presence of its also undefined non-urbanised lands confined by, within, or in-between fragments. In Hebbert's words:

‘the built-up area of any modern city tends to be surrounded by a transitional zone which is neither fully urban nor fully rural but instead displays a mixture of uses and building types interspersed with agricultural and vacant land’ (Hebbert, 1986: 141).

This ambiguity, however, is not such when suburban undeveloped lands are seen from outside the urban scope. In this sense, what is an ‘ambiguous’ or ‘undeveloped’ space under the urban lexicon can be clearly defined as an ‘ecotone’ or as a very well-defined zone of transition between two or more different ecological communities (Odum and Barret, 2006). So, contributions from political ecology, ecosystem services, green-infrastructure, urban agriculture, natural capital, regional policy and even splintering urbanism emerge as necessary complements to understand the multifaceted nature of the unbuilt geography of urban sprawl and its components. But in the scope of suburbanisation, these undeveloped lands emerge as ‘gaps’ – not only physically but also politically – that depict the particular context in which they are manifested. That is to say, they do not exist without the presence of urbanised surroundings that confine their morphological and functional aspects. In practical terms, they usually reach the expression of pieces of countryside, forest lands, infrastructures, vacant lands and others that have not been driven by planning policies and so, still remain as ‘out of control’ or unregulated. These undeveloped lands emerge

by several factors and often reclaimed to be densified or definitively restricted.

So, urban sprawl is finally a clear dual landscape composed by built-up areas and a still unexplored unbuilt geography defined by a wide range of undeveloped lands and open tracts. In Gillham's words:

‘The result is a haphazard patchwork, widely spread apart and seeming to consume far more land than contiguous developments. Unless preserved or unbuildable, the remaining open tracts are usually filled with new developments as time progresses’ (Gillham, 2002: 4-5).

These undeveloped lands are varied and offer different possibilities to explore improvements on housing policies, as environmental reservations, public spaces or simply as wildlands for biodiversity and educational purposes. In a similar vein, undeveloped lands are also recognised as scenarios of economic speculation assessed in comparison to their urbanisation possibilities. What is clear is the fact that ‘undeveloped lands’ – a fairly debatable term that is addressed in coming sections of this research – are neither ‘empty’ nor inert spaces but somehow depressed or with decreased levels of urban functionality such as brownfields, landfills and others in functional obsolescence (Barnes, et al., 2001; Yeh and Li, 1998; Hebbert, 1986). In this regard, undeveloped lands can be also involved in transformation processes considering their latent condition as ‘developable’ and so, as areas that could eventually be (sub)urbanised (Hovinen, 1977). In this light, undeveloped spaces are intrinsically transitional or ‘pending’ – conditioning the nature of sprawl as dynamic, mutable and with different rhythms of transformation.

#### **2.4 THE SCOPE OF THE UNBUILT GEOGRAPHY**

Just as urbanised lands are extended across the suburban landscape, so too are unbuilt spaces. So, the spatial distribution of undeveloped lands takes place at different locations and thus, is defined by different surroundings in a variety of forms that can include residential neighbourhoods, industrial, agricultural or recreational areas or a mix of them.

This distribution determines different contextual relations that define the particular character of each suburban undeveloped land, apart from their own characteristics. In this vein, they can be differentiated regarding their relational character and the properties to connect different areas or to be integrated with. Whatever the case, fringe/belt areas will influence the rural character of undeveloped lands as well as inner lands will influence their suburban identity. This balance between their spatial and functional properties, and characteristics of surroundings finally determines their relational character and thus, their levels of integration to the urban fabric.

#### **2.4.1 The urbanised countryside**

The ‘urbanized countryside’ (Sieverts, 2003) is a concept that describes the urban-rural boundary composed by rural and urban areas. It is understood as a new territory which is neither urban nor rural at all, but embraces characteristic of both (Sieverts, 2003). According to Tacoli (1998), ‘urbanized countryside’ is a problematic concept because urban and rural activities take place in the same geographical space that finally defines a hybrid zone where agricultural and non-agricultural activities are spatially and functionally integrated (Tacoli, 1998). For some authors, this conceptual ambiguity remains considering that in some contexts urban sprawl still shows traditional residential supremacy and in others it emerges as hybrid and heterogeneous. According to Leontidou and Couch (2007):

‘Hybridity is usually discussed through the merging of nature and culture extended to the rural within the urban, the agricultural within the industrial, so forth. Such mosaics of activities and land use patchworks are frequent in most peri-urban landscapes and make them different from cityscapes, suburbs and satellite towns. They are spaces in-between suburbs and villages beyond metropolitan regions’ (Leontidou and Couch, 2007: 244).

This mixed condition of fringes/belt areas also influences its physical, functional and economic performance and implies several tensions between old and new land-uses that finally create multi-functional landscapes that demand a specific attention – or non-standard solutions – as emergence of a new urban context (Gallent and Shaw, 2007).

Aside from conceptual complexities, the multifaceted character of fringe/belt areas is also understood as a source of mutual urban/rural benefits. The spatial proximity, for instance, allows developing symbiotic activities – traditionally separated from each other such as urban farming, tourism or services provision – in a relation of mutual interdependency. In Tacoli's words (1998), 'urban agriculture can be an efficient way of recycling urban waste and of contributing to resource conservation in surrounding rural areas, for example through urban-based production of fuelwood' (Tacoli, 1998: 158). Following this idea, Van Leeuwen and Nijkamp, (2006) posit that the historical productive logic of the countryside should consider opportunities supported by its new stage of economic and environmental links with the city's growth. So, the 'urbanized countryside' must shift the way of traditional functions based on exclusive farming productivity to activities that decrease natural processes (areas with controlled water levels and insecticides) and ecosystem disruptions, surpluses of manure, cattle diseases, etc. It implies that the agricultural sector in urban fringes ought to focus more on food quality, environmental processes and more sustainable ecosystems rather than traditional extensive cultivation (Van Leeuwen and Nijkamp, 2006). Supporting this fringe/belt character, several factors emerge as comparative advantages considering that farming near the city supposes positive interactions with the city and economic stability. In addition, the increment of infrastructure transforms fringe areas making them more attractive to development and for inclusion in plan-making. In Van Leeuwen and Nijkamp's words:

'Nowadays, with an increasing population, the consumption function of the countryside becomes more and more important for all kind of citizens. Rural areas close to larger cities are considered as the backyard of thousands of urban residents. At the same time, the increasing accessibility of city and hinterland allow rural residents to work and enjoy cultural activities in the city' (Van Leeuwen and Nijkamp, 2006: 294).

In a similar vein, Meyer-Cech and Seher (2013) support the symbiosis between citizens and their suburban rural landscapes even for daily-life activities:

'farmed land perceived not just as a land reserve for development but appreciated for all the other functions it might fulfil, is much easier to preserve. Project

oriented interventions can assist in improving the image of periurban farmed land. Upgrading of agricultural areas by linear and punctiform interventions can specifically serve recreational purposes, e.g. establishing walking, biking and riding infrastructure, or it can provide a basis for the appreciation of agriculture as a 'scenic resource', e.g. by Land Art interventions...'linear and punctiform infrastructure and landscape interventions along field borders ensure that farmers further dispose of their land and decide on the way of cultivation but also set incentives for opening up additional resources of income from recreation activities' (Meyer-Cech and Seher, 2013: 305).

So, the 'urbanized countryside' is a geographical area of opportunities and symbiosis in which the city is enriched by the presence of undeveloped lands and its activities are part of both the countryside and the city.

#### **2.4.2 Inner suburban lands and their ecological contents**

Inner suburban lands are diverse in their functions and spatial characteristics, and constitute a relevant aspect of the unbuilt suburban geography. Although varied, these areas are commonly recognised elements with ecological contents and benefits. Studies mainly provided by the literature on ecosystem services (Green, et al., 2016; Douglas, 2008), natural capital (Wang, at al., 2010) and urban political ecology (Heynen, et al., 2006) coincide in the condition and potentials of undeveloped suburban lands as 'green infrastructure'. In many ways, inner suburban lands have a positive connotation in social and environmental terms. This does not only strictly refer to urban sprawl but also to the whole city and includes a wide range of open spaces from fringe/belt areas to the city's core.

So, different from squares or parks – in which social interaction is the main aim – 'green infrastructure' refers to more functionally undefined areas but nevertheless interlinked with the built environment to contribute to biological and environmental preservation. In this vein, 'green infrastructure' is described as an interconnected network of different green spaces with associated benefits for both human well-being and nature (Lafortezza, et al., 2013). Although its objective is mainly environmental and so, understood as unoccupied, these lands can host different functions including parks, squares, green corridors, waterways, woodlands, public places, avenues and others. Scrutinising its structure, Lafortezza (2013) asserts that 'green infrastructure' is composed of 'hubs' and 'corridors' manifested at different geographical scales. In these spaces people can share

some expressions of wildlife, social encounters and public activities and thus, they provide important social benefits (Lafortezza, et al., 2013).

So, undeveloped lands that are considered as elements of green-infrastructure and are recognised as relevant for human health and thus, aimed to be preserved and promoted as collective expressions of public interests (Lafortezza, et al., 2013). Indeed, the debate regarding their ecological contents and benefits – especially in metropolitan areas – highlights their contributions and characteristics as natural instead of intervened spaces. Farmlands are nevertheless seen as relevant elements that offer valuable ecosystem services: ‘Farmlands and woods and shrubs play an important role in controlling evapotranspiring processes and in mitigating urban pollution inside highly urbanized settlements’ (La Rosa and Privitera, 2013: 96). The authors also assert that these lands ‘... preserve biodiversity, sequester CO<sub>2</sub>, produce O<sub>2</sub>, reduce air pollution and noise, regulate microclimates, reduce the heat island effect, affect house prices and are useful for health, well-being and social safety’ (La Rosa and Privitera, 2013: 94-95).

In terms of policies, ‘green-infrastructure’ is understood as ‘green-engines’ for cities (La Greca, et al., 2011; Lafortezza, et al., 2013; Sandröm, 2002) and as ‘ecological-networks’ in terms of functions and impacts (Bennet and Mulongoy, 2006; Chiesura, 2004; Grim, et al., 2008; James, et al., 2009; Tzoulas, et al., 2007; Zhang and Wang, 2006; Walmsley, 1995). According to La Greca (2011), these lands and their relations are physically and spatially relevant, and their implications go beyond the mere provision of green spaces:

‘Their consequences go beyond the environmental pollution and climate change challenges. Green areas are fundamental to increase urban quality creating more pedestrian friendly and visually pleasant settlements. Landscape planning and management should be based around multi-functional green networks or green infrastructure’ (La Greca, et al., 2011: 2193).

There is a consensus that ‘green-infrastructure’ is important to promote healthier cities. Thereby, in several political agendas it appears as a priority and as part of the promotion of more sustainable societies. Consequently, it

has been used for the creation of several institutions and programs in which their green character supports contemporary views of urban sustainability. This is a clear sign of the implications of these lands in planning and environmental policies. According to Thomas and Littlewood and based on the case of The Netherlands (2010):

‘What is described in the Netherlands has some parallels with what can be observed of institutional formation and memberships and in terms of the techniques applied to the promotion of “the case of nature”. An important element of this case is ways in which nature can be called to support other more dominant (or ‘harder’) political discourses and a key means to calibrate this support is via notions of “ecological modernization”. Ecological modernization, represents a broad array of approaches to the social construction of nature, which are relatively optimistic about the potential for coexistence of nature and society’ (Thomas and Littlewood, 2010: 212).

Socio-economically speaking, ‘green-infrastructure’ is seen as an easier way of providing social services in comparison to traditional infrastructure. Basically, traditional ‘infrastructure’ – such as bridges, squares, transport or others – supposes high costs, bureaucracy, coordination of different actors and maintenance and thus, financial arrangements only justified by high demands or specific priorities (Samdröm, 2002). However, green infrastructure supposes open spaces that can easily be provided and supposedly easier to maintain. Although this, there is a conceptual constraint in the understanding of green-infrastructure that confirms its asymmetric position in comparison to the traditional one. In Samdröm’s words:

‘Traditionally, “green space” has been used to refer to parks and other natural areas in towns and cities. Recreation has been the main role of this space...It therefore seems necessary to upgrade urban space, preferably as a coherent planning entity green infrastructure, and accord it the same status as other physical urban structures, e.g. buildings and highways. Only then would urban planners widen their attention to the manifold functions of urban green spaces’ (Samdröm, 2002: 379).

At any case, the economic estimation of open spaces in fringes is linked to public benefits and thus, they are somehow considered in alternative valorisation of socio-economic benefits. A non-market valuation, for instance, includes issues of ecological preservation and diversity, availability to provide public amenities, efficiency in serving large groups of residents, improvements of air quality and natural landscapes. It has been

part of financial strategies to support the provision of green spaces based on their ‘hedonic value’, for instance, the transference of financial benefits, or simply to reinstall municipal attributions and public rights (Spencer, 2007).

In political terms, ‘green-infrastructure’ is described as a contribution from local scales to the global debate supported by international agreements regarding the natural environment. It has been included in a range of economic assessments aimed to engage private investments and the promotion of more dynamic incentives as alternative to traditional protectionist narratives. Thomas and Littlewood (2010) argue that ‘more specifically, ecological modernization has been argued to provide a potential basis for reconciling economic development with ecology and providing *win-win* outcomes for nature and economy’ (Thomas and Littlewood, 2010: 212). Indeed, the benefits of reinforcing the relationship between ecology and economic development have been posited as a concrete route for policy-making and economic promotion:

‘various ways are described for the environment to support economic growth and investment, land property values, labour productivity, tourism and agriculture’... ‘Rather than rely on rather nebulous and hard-to-quantify traditional measures of ‘nature services’ used in planning, such as amenity or tranquility, something more hard-nosed that will have more traction within the reductive calculus of the new soft governance is proposed’ (Thomas and Littlewood, 2010).

Spatially speaking, ‘green-infrastructure’ provides a variety of spatial qualities supported by nature and its impacts in the perception of healthier environments. So, factors such as interiority, intimacy, light variety and colouring, clarity, darkness, narrowness, amplitude, depth, diversity of perspectives, textures and others are used by urban and landscape designers to improve suburban quality (Bowler, et al., 2010; Diener, et al., 1984; Espeseth and Cassens, K. 1996; Laforteza, et al., 2009; Walmsley, 1995; Wickham, et al., 2010).

### **2.4.3 Contiguous expansion**

Another scope in which the unbuilt suburban geography is placed refers to foreseen (or planned) spaces for expansion. Although sprawl is seen as an uncontrolled growth, plans and regulations estimate undeveloped lands as

‘extension areas’ for future urbanisations. These are usually located near consolidated zones or infrastructure and intended to support continuous or discontinuous ‘extensions’. These areas are often criticised because although pointed in plans, they are not always developed, neither consolidated. They are seen as inefficient zoning and linked to negative connotations of suburbanisation related to massive residential expansion (Weber and Puissant, 2003). There is no a specific pattern of location for extension areas but they use to be part of suburban surroundings linked to transport infrastructure or services as factor of marketing or competitive advantages (Camagni, et al., 2002). These lands for expansion are evaluated in terms of geographical, technical and economic feasibility. Some of factors refer to physical constraints that derive in higher investments to prepare the land for urbanisation, and others refer to increasing population rates and housing demands. As a result, some undeveloped lands remain as gaps within the suburban fabric; others increase their land-value and become finally unaffordable for original social purposes (Phelps, 2012).

In some cases, policy-makers protect well-located lands to provide services and so, change suburban trends. In others, policy-makers see these lands as suitable for social-housing developments and to accomplish political goals. In a similar vein, private developers also explore these undeveloped lands as opportunities, promoting land-use changes or the acquisition of strategic locations beforehand. After a certain time, peripheral lands are mostly privatised and thus, planning regulations are strongly dependent on particular interests and the rights of keeping private properties without development (López, 2011).

As seen, undeveloped lands for expansion are controversial as they illustrate the disparity between the ‘ideal’ (or planned) city and real suburbanisation. However, despite the strong position of private interests, in some cases the public sector also seeks to keep empty lands related to socio-environmental benefits or to ameliorate impacts of incompatible functions. In this light, buffers of security commonly result in undeveloped lands as a result of heavy infrastructures or industries (Cervero, 2003; Graham, 2000; Banerjee, et al., 2012). In particular, transport infrastructures are a strong indicator of

competitive advantages and so, developers always search to obtain parcels well served by roads. According to Cervero (2003), the competitiveness of undeveloped lands deals with two initial conditions controlled by market factors: the speculation based on early information about future political decisions, and the proper expansion of business, services and facilities that will need accessibility and new locations often supported by construction of new roads or motorways (Cervero, 2003). So, an extension area that is well supported by these conditions becomes attractive and thus, part of economic, political and financial disputes that define them as contested, sometimes more controlled by plans or financial speculation.

Undeveloped lands for extensions can also emerge as unplanned. This is the case of those surrounded by developments that demand connections through them. In these cases, their relational character suggests a change in land uses – not because of their own properties but rather for the relevance of their surroundings. These areas confirm their relational character hosting different types of infrastructure. So, prime network spaces – such as conurbation zones and others – are then defined for major transportation and communication hubs composed by airports, ports and distribution centres. According to Keil and Young (2011), areas crossed by roads are finally potential expansions although they could originally emerge as restrictions (Keil and Young, 2011).

In the case of ‘conurbation zones’, efficient corridors of infrastructure are important factors in transforming undeveloped lands. According to Batten (1995), there are European examples of regional conurbations – such as the London-Cambridge and Stockholm-Uppsala corridors – that describe ‘bicentric urban systems’ where relational linkages tend to be horizontal rather than hierarchical. As a result, urban configurations on expansion areas take the form of ‘corridors cities’ defined by regional impacts on somehow unregulated lands (Batten, 1995). In a similar vein, Naes (2011) confirms that ‘new developments in German urban regions typically take place in the ‘Zwischenstadt’ (Sieverts, 2003), i.e. in the areas between the cities and not within immediately adjacent to the cities’ (Naes et al., 2011). Thus, expansion areas are contexts for both new developments and

infrastructure, and could be indicated in plans or *de facto* embedded within differentiated urbanised regions.

## 2.5 THE NATURE OF THE UNBUILT GEOGRAPHY

The unbuilt geography of urban sprawl is determined by different factors that define its nature as a more or less active dimension of the suburban landscape. Some of these determinants are placed in different institutional frameworks that influence the characterisation of the undeveloped lands that coexist with different residential functions. In this context, several undeveloped lands are considered as relevant for their potential to change suburban trends, land capacity and socio-environmental contributions at different scales. In this vein, disclosing the determinants of the unbuilt geography provide useful perspectives to understand its nature, values and impacts.

### 2.5.1 Determinants of the unbuilt geography

Undeveloped spaces, vacant lands, open tracts and other components of the unbuilt suburban geography emerge by different factors. It is clear that they become visible due to the suburban expansion, but not as mere by-products of this.

In this light, institutional purposes – administrative, economic and financial goals – play a crucial role in determining the origins of peripheral land-uses. Rural suburban lands, for instance, suggest regulatory correspondence with agricultural or environmental norms, different from military facilities or industrial installations linked to strategic and productive activities. What is clear, is the fact that the unbuilt suburban geography is determined by diverse factors and so, they deserve to be explored in order to understand the proliferation of suburban unbuilt spaces, institutional coexistences, and their situation regarding planning policies aimed to control and regulate suburbanisation processes.

#### *Zoning, plans, regulations and market conditions*

Some undeveloped lands are determined by plans and regulations, explicitly intended to configure security zones, industrial and entrepreneurial

extensions, institutional growth or future public spaces. These are the cases of protected green corridors, buffers of security, parks, squares and others. They are expected to be positive in terms of socio-environmental and economic benefits, and are often linked to formal regulations. According to Talen (2013), researchers have drawn connections between sprawl and regulations that derive in plans and zoning. In this context, architects and planners have strategically seen undeveloped areas as a ‘buffer’ between incompatible functions (such as industries and residences, for instance) that contributes to sprawl since they seem to be randomly distribute over the suburban territory – not as public places but rather for cushioning differing functions. These open spaces are ‘planned’ buffers to protect facilities, new developments or to absorb negative impacts:

‘There are many examples of this phenomenon, such as residential zones adjacent to eight-lane freeways, and public amenities surrounded by low-density, single-family zoning. In most cases, a more appropriate spatial pattern would put open space or more resilient uses adjacent to freeways, and higher-intensity land uses adjacent to public amenities’ (Talen, 2010: 179).

These buffers do not have functions except for temporary activities or to host nature. Over time and depending on the context, many of them become underused, vacant lands, and because of their apparently condition as abandoned they can be encroached by informal occupations, landfills or others deriving on negative perceptions and impacts (Ige and Atanda, 2013). In other cases, vacant lands appear as outcomes of industrial decline or contextual constraints that influence their perception as negative or positive elements and so, their production and maintenance (Foo, et al., 2013).

In particular, market constraints and privatisation of unbuilt areas are relevant to understand why they increase deterioration and how regulations and lack of maintenance influence their quality. In Foo’s words: ‘the production of vacant lots has coincided and interwoven with an urban history characterized by increasing privatized public realm and growing socio-political and economic polarization’ (Foo, et al., 2013: 156). So, land privatisation literally creates ‘undeveloped’ or ‘vacant’ lands as financial mechanisms collate risks of keeping them abandoned or physically closed. Conversely and in some cases, this situation can finally determine

detriments in property values and encourage their reconversion into built-up areas (Foo, et al., 2013).

### ***Functional obsolescence***

As mentioned, functional obsolescence also contributes to the presence of undeveloped lands and their deterioration. This situation is more visible in emerging economies in which financial asymmetries restrain reconversions and interventions rely almost solely on market trends. Additionally, planning regulations are often set to promote expansions instead of urban regenerations, above all considering associated cost derived from the presence of heavy infrastructure or pollution. Over the years their presence becomes common and so, somehow accepted by residents and authorities as part of the suburban landscape. According to Ige and Atanda (2013), urban growth in developing countries has not been driven by a balanced proportion of services in which the presence of isolated, haphazard and incidental vacant lands appears as normal, as well as their negative impacts such as illegal occupations, landfills and others informal encroachments (Ige and Atanda, 2013).

### ***Financial constraints***

In contexts highly influenced by economic speculation, vacant lands appear as commodities or as public reservoirs for expanding services. Some others are acquired beforehand – intended to remain vacants – to assume incremental demands of housing, services and infrastructure. Others vacant lands emerge as outcomes of outer developments that leave undeveloped space between old and new urbanisations. As Holcombe indicates, ‘leapfrog development occurs when developers build new residences some distance from an existing urban area, bypassing vacant parcels located closer to the city’ (Holcombe, 1999). It is explained because developers choose cheaper lands outside urban limits rather than expensive inner lands. This influences affordability and provides advantages related to housing and open space. So, residents accept longer commutes in exchange of lower-priced houses, and vacant lands appear ‘in-between’ as part of their common landscape (Holcombe, 1999).

*Geographical constraints*

Geographical constraints also determine the presence of undeveloped lands. Since the early 60s, Clawson identified differences between countryside areas – such as fertile lands, hills and other restrictions – that affect buildings costs and thus, tend to remain undeveloped. Although in some specific situations some restriction zones – such as floodplains, landslides and other handicaps – can be assumed as positive for leisure or recreation, they use to be more expensive and so, remain undeveloped. It also includes good quality lands but without accessibility or physical conditions to provide transport, water and energy supply. In this category are also the conurbation zones – that used to be outside regulations – with lands susceptible to be urbanised (Clawson, 1962). So, farmlands, forest lands, brownfields, abandoned facilities, hills and other geographical restrictions, non-feasible location for energy and water supply, environmental protected open areas, massive public places and conurbations are some of their expressions and contribute to the fragmentation of the suburban landscape.

*Environmental elements*

The environmental contribution of some areas also emerges as factor to preserve them as undeveloped. Although rarely mentioned, empirical evidence suggests that the loss of open space derived from urban encroachments results in small and isolated open patches of natural habitat surrounded by residential, commercial, or industrial lands. This decline of open space affects the natural development of some species and thus, become finally environmentally inert. In the mid-Atlantic region, for instance, concern about habitat fragmentation caused by urban expansion is focused on forested habitats, largely because forest is the climax vegetative community in the region (Hess, et al., 2001). In the same vein, Harvey and Works (2002) describe regulations for creating and protecting open areas because of their importance to the viability of local farmlands. Specifically, and regarding the metropolitan scale, authors describe the ‘Urban Growth Boundary’ zone (UGB) established in 1979 to protect farms and forests from urban encroachments in the region of Portland, Oregon. It was a state-mandate package of land-use laws that explicitly stated the presence and promotion of non-urbanized areas, irrespective of urban sprawl (Harvey and

Works, 2002). However, they also illustrate drawbacks of these regulations because always plans are made from and for ‘urban needs’ instead of ‘rural’ or ‘environmental’ needs. Thus, final outcomes of the urbanisation process are open tracts with few possibilities to become environmentally efficient and so, it finally derives in mere vacant lands embedded within the suburban landscape (Harvey and Works, 2002).

### *Suburban ideals*

A more political, cultural and social explanation for the presence of vacant lands, undeveloped areas and open tracts in suburban areas pertains to permanent migrations to urban fringes. According to Phelps, there is a persistent process of social mobility and economic security represented by suburbs. Basically, their significance rests on access to private properties, car trips and harmony with nature as elements of suburban ideals of personal freedom, and residential preference balanced with recognition of economic and fiscal realities (Phelps, et al., 2010). In this context, suburban vacant lands emerge as valuable elements for the aspirational suburban life-style as they provide generous space and nature (Holcombe, 1999).

Summing up, suburban vacant, undeveloped or open lands are determined by different political, economic and socio-cultural factors. These determinants can be specified by contextual situations but they generally disclose socio-financial constraints. What is clear is the fact that although the suburban space emerge from somehow standardised processes, undeveloped areas appear in suburbia as non-standard elements and triggered by differing determinants.

### **2.5.2 Categories of undeveloped lands**

Current categorisation of undeveloped lands is mainly based on functional and environmental properties. In this vein, Wandl (2012) proposes a basic taxonomy composed by green areas, bodies of water, farmlands, areas between infrastructures, leisure and sports facilities, derelict lands, open spaces around nodes of transport and big parking areas (Wandl, 2012). These categories are strongly influenced by geographical properties and land fertility, as well as the presence of infrastructures. However and based

on the spatial character, it is possible to summarise these categories in ‘geographical restrictions’, infrastructural, derelict and agricultural lands, and large-scale open intervened spaces.

Apart from the aforementioned, there are still more categories considering functional specificity and contents, and the emergence of different lands from non-European contexts that amplify Wandl’s taxonomy. So, ecological lands, buffers of security, industrial and historical zones, administrative boundary areas, closed lands (such as military facilities, heavy industries and others) and vacant spaces used as financial commodities can also be included as different types of undeveloped lands in unbuilt suburban space.

### ***Ecological lands***

As discussed, the unbuilt suburban geography is composed by a series of elements of green-infrastructure and ecosystem services, recognised for their contributions in diminishing air pollution, noise and increasing biological patrimony. They are not only ‘green’ lands as they illustrate different ecological contents and ecosystem services at different levels and so, include contributions of derelict and unattended sites with vegetation, or even those that present certain degree of densification. In this vein, ecological lands are a category that can be incorporated into the urbanised environment as part of an interlinked net of green infrastructures. Areas like parks, squares, abandoned spaces with vegetation or protected areas are also identified as a category of ecological undeveloped lands (Kim, et al., 2015; Johnson, 2015).

### ***Buffers of security***

Buffers of security are also identified as a category of suburban undeveloped land. They are necessary to protect human life from dangerous situations – such as high-speed motorways, pollution, geographical hazards – or to cushioning incompatible activities such as heavy industries and residences. These lands of security are often recognised in plans, properly signalised and with restricted access, except for temporary activities such as maintenance, sport or leisure. These lands although undeveloped are

deliberately determined in master plans and thus, aimed to remain undeveloped (Zhang, et al., 2013).

### ***Industrial undeveloped lands***

Several industrial lands also appear as undeveloped (or less developed). However, this condition mostly refers to areas with diminished functionality or simply in a stalemate. In terms of density and locations, they also emerge as underused considering truck circulations and large parking areas. In this category are brownfields and landfills that cannot be reactivated, or others obsolete functions that required large investments to be recovered. These are reclaimed lands to be reintegrated due to generally high degrees of pollution (Frantál, et al., 2015; Mathey, et al., 2015).

### ***Historical zones***

Several historical zones and heritage are identified as undeveloped. They include open tracts with archaeological rests, old monuments and ruins, in which the presence of valuable heritage determines their protection or restricted use. In this category are also cemeteries that define semi-open public spaces as parks, interconnected squares or public corridors. All of them are symbolic spaces enabled with basic amenities to facilitate temporary visits or work. To some extent, these lands are closed environments for immediate surroundings (Saxena and Sharma, 2013; Afla and Reza, 2012; Li, et al., 2014).

### ***Administrative boundaries***

A less evident category of undeveloped lands are the administrative boundaries between different districts. Many boundary areas appear as undeveloped because of their somehow undetermined political impacts, benefits in providing services, jurisprudence, taxation management and land regulations. In some cases the location of services and infrastructure on boundary areas result in externalities being borne largely by the populations of neighbouring areas. This operates at local, central, regional, national and even international levels of jurisprudence. These are the case of inter-municipal lands, for instance, in which boundary investments are relegated to central levels or for metropolitan facilities (Delgado, et al., 2008; Becker,

1966). At international levels, cross-border urbanised regions leave boundary lands for border controls and administrative offices. In a similar vein, regions with military conflicts define different types of boundaries or 'ceasefires zones' without any installation to establish vacant lands often occupied by UN staff, NGOs or international organisations (Newman, 1997).

### ***Restricted undeveloped lands***

Restricted zones are another category of undeveloped land. These areas emerge when the urban expansion reaches outer restricted installations such as military facilities, chemical industries, power (nuclear) plants, heavy industry or any others – even with internal regulations. Generally, these spaces appear for non-urban purposes and their administration belongs to centralised institutions such as defence, public works or industry. Once urbanised, a fundamental question about military facilities is their closure for civilian uses considering their cost in personnel, installations and infrastructure. Regarding socio-political impacts, it is noticed that many military facilities are located in suburban jurisdictions where local population and authorities perceive them as controversial as they reinforce local identities but are functionally incompatible. However, their closure is often linked to military requirements, physical conditions, land capacity, operational costs, saving for closure and environmental impacts in surroundings (Warf, 1997). Reconversion of these lands supposes strong political coordination at different levels and the stability of planning tools beyond contingencies (Bagaeen, 2006; Ponzini and Vani, 2014).

### ***Vacant lands as financial instrument***

It is also possible to find vacant lands without restrictions to be developed. However, these areas remain empty because landowners use them to catch value or are not compelled to taxation. It increases with the arrival of the city to make them attractive for new projects or simple as financial commodities (Stanley, 2014). In a similar vein, public institutions also speculate with vacant lands for future public benefits. Some areas are institutional reserves to provide services, housing or infrastructure. Their condition as empty is also assumed by local communities as opportunities

for community projects such as gardening, city-farming, parking areas, residential yards or sport fields to avoid informal occupations or undesirable social behaviours (O’Callaghan and Lawton, 2016; Kremer, et al., 2013).

Summing up, the unbuilt suburban geography describes different categories of undeveloped lands depending on their functional, physical, economic, social and political nature, expressed by geographical restrictions, infrastructural lands, derelict spaces, agricultural undeveloped areas, public spaces for massive encounters, green spaces, buffers of security, industrial areas, historical sites, boundary zones, closed environments and lands for speculation.

**2.5.3 Natural and intervened undeveloped lands**

Irrespective of their planned/unplanned condition, undeveloped lands of sprawl illustrate different degrees of intervention in a range from totally intervened lands – such as squares or parks fully designed – to natural lands in which there are no signs of intervention (Table 1).

NATURAL UNDEVELOPED LANDS	INTERVENED UNDEVELOPED LANDS
Geographical accidents	Farmlands
Restriction zones	Storage centres
Pieces of countryside	Landfills / Brownfields
Green corridors	Large Parking areas
Protected and natural ecosystems	Buffers of security
Open spaces	Public spaces and facilities
Forests and wood lands	Conurbation zones

**Table 1.** The two types of undeveloped lands: natural and intervened (author’s table)

***Natural undeveloped lands***

On the one hand, natural undeveloped lands are generally illustrated by geographical accidents in which nature and wildlife has been developed free, in still somehow untouched ecosystems. These areas can be found at different locations, scales and with diverse physical characteristics, and could even be without regulation. These areas are often defined by hills, slopes, flood valleys, pieces of countryside and even mountains, rivers and the sea (as the case of suburban landscapes developed among sea channels, for instance). On the other hand, regulated natural spaces emerged as

protected ecosystems, reservations and forests, restriction zones or green corridors. These 'wildscapes' are valuable resources for both urban and regional environments (Jorgense and Keenan, 2012; Gobster, 2012).

### *Intervened undeveloped lands*

Different from natural undeveloped lands, intervened ones show some degree of intervention and can include a minimum regulation from different institutional frameworks – such as agriculture, natural resources or environmental offices. Farmlands, for instance, are often tied to agricultural regulations. In the same vein, landfills, water or energy plants are framed by environmental regulations. Brownfields, landfills or buffers of security, for instance, are areas framed by industry or public works. Parks and public spaces also imply regulations regarding security, provision of services and maintenance, water and energy supply, landscape and wildlife preservation, and waste management from local and/or centralised offices.

Intervened undeveloped lands do not hold the same level of quality and social connotation depending on their levels of occupation. In the case of heavy infrastructure such as motorways or power plants, for instance, their buffers of security do not host any form of permanency as they are restricted to protect human life from accidents, noise or dangerous pollution. This inactivity derives in high levels of deterioration, lack of maintenance or natural recycling for minimum levels of ecological performance. In a similar vein, speculative lands that remain undeveloped for long periods can be also perceived as derelict by local residents.

Depending on the scale of analysis, some undeveloped lands can embrace a mix of different degrees of intervention and institutional control. These are the case of conurbations, for instance, formed by both natural and intervened lands managed by differing institutional actors that share the same geographical area. Here, it is possible to find different groups of undeveloped lands organised in different forms such as a forest beside a farmland, a power plant with buffers of security, or 'inside' others, such as power plants surrounded by a buffer of security and then by open countryside, all inside the conurbation. These areas dilute their boundaries

to the regional space and vary from region to region, defining complex undeveloped geographies in which there are neither spaces in-between nor undeveloped or intervened lands at all (Barbati, et al., 2013).

#### **2.5.4 The relevance of undeveloped lands of sprawl**

Undeveloped lands of urban sprawl illustrate different levels of relevance depending on contextual factors and evolution over time. However, and as previously discussed, their relevance can be highly determined by their negative impacts derived from their condition as derelict, abandoned, deteriorated or unused, or by their positive connotations as elements of green infrastructure, ecosystem services, public venues or simply as natural spaces for urban wild-life. These two dimensions can place undeveloped lands at different level of priority in urban agendas for transformation or preservation.

##### ***Conceptual and instrumental relevance***

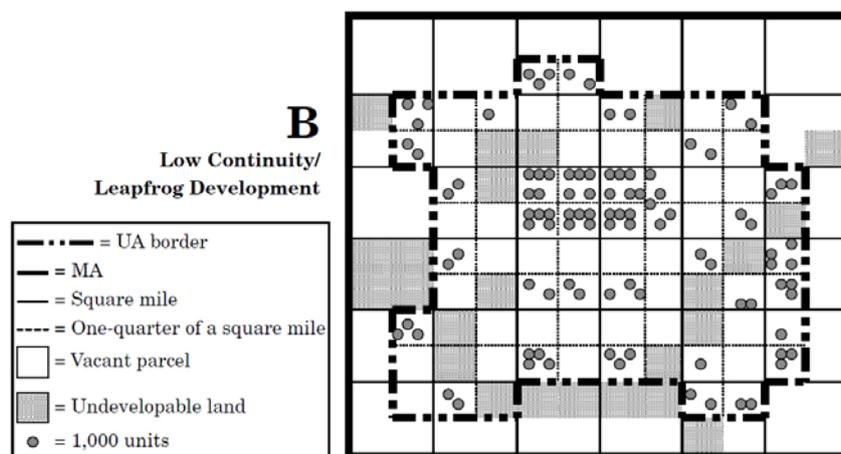
Undeveloped lands have conceptual and instrumental values as they influence the degree of fragmentation, continuity or discontinuity of an area and thus, its characterisation as ‘sprawl’. In this light, Yeh and Li (1998) use different mapping technics to measure and monitoring the degree of urban sprawl in Chinese cities, and confirm that fragmented and scattered patterns are strongly depends on ‘vacant lands’ that directly affect the sprawl index (Yeh and Li, 1998). Similarly, Siedentop and Fina, (2010) argue that open areas are not commonly used as indicator but nevertheless emerge as available lands to be covered and so, would affect the sprawl condition. These areas directly influence other indicators such as ‘density’ and ‘continuity’, for example, also altering the final sprawl index. The authors distinguish different categories of undeveloped lands in which a simple ‘open space’ without functions emerge as different from an ‘undisturbed open space’ useful for residential developments and so, not considered as mere ‘undeveloped’ lands. They identify the amount of open space in an area – understood as ‘effective shared open space’ – and distinguish them from others with functional properties and potentials for promoting biodiversity, public places, social space and others (Siedentop and Fina, 2010). Finally, they assert that large open areas influence the ‘openness

index’, also useful to determine the sprawl degree (Siedentop and Fina, 2010).

On a more morphological view, Galster (2001) identifies vacant and undevelopable lands as key factors to determine the sprawl index. Among other dimensions, vacant lands are discussed as passive or active open space, along with agricultural lands and public facilities (Galster, et.al., 2001). Again, undeveloped lands influence ‘discontinuity’, used to distinguish different areas not necessarily identified as ‘sprawl’. In Galster’s words:

‘Discontinuous development could be characterized as sprawl in some cases but something else in others. Thus, the development of planned urban centers with moderate to high densities, separated along a transportation corridor by greenbelts or open spaces, might not be characterized by some commentators as sprawl’ (Galster, et.al., 2001: 688).

Nevertheless, Galster et al also emphasise that some elements of physical discontinuity – such as bodies of water, protected wetlands, forests, parks, slopes, or soils; and freeways, interchanges, or other public reservations and facilities – do not necessarily determine interruptions of continuous developments as they are mainly associated with changes in density or other factors (Galster, et.al., 2001) (Figure 3).



**Figure 3.** Galster’s diagram to describe the degree of ‘continuity’ and ‘discontinuity’ determined by vacant parcels and undevelopable lands (Galster, et al., 2001)

In a similar vein but aimed to measure the fragmentation of natural suburban environments, Zhang (2012) addresses landscape metrics based on

characteristics of landscape structures and suburban land fragmentation. The author argues that ‘fragmentation’ is a matter of degree that illustrates the ‘intensity of sprawl’. Focused on human impacts on landscape structures, ‘fragmentation’ is defined as a ‘land cover types process’ in three categories: 1) developed lands – determined by construction materials such as asphalt, concrete, and buildings, 2) undeveloped lands – determined by bodies of water, sterile lands, forests, shrub lands, herbaceous upland, woody wetlands and emergent herbaceous wetlands, and 3) cultivated lands – determined by food production. The last one includes areas such as parks and golf courses (Zhang, et al., 2012).

### *Socio-cultural relevance*

In some contexts, suburban undeveloped lands have a clear socio-cultural relevance based on their different functions and activities related to tourism, education and research (Sieverts, 2003; 2011; Tacoli, 1998; Gallent and Shaw, 2007; Van Leeuwen and Nijkamp, 2006). These activities are relevant due to their impacts on local economies, sense of identity and the intensification of suburban areas. Empirical evidence indicates that these undeveloped lands influence social behaviour and psychological aspects that enrich human life with spiritual significance, emotional sensitivity and immaterial benefits (Banzhaf, 2007; Chiesurahico, 2004). Natural environments are ‘specific’ and make places singular as alternative to residential environments defined by the massive industrial production of houses and infrastructures. In this light, Home (2010) argues that undeveloped lands are crucial to specify identities and as social venues that promote shared values and sense of community and safety:

‘The higher density urban living that results from the loss of green spaces to development has potentially significant implications for citizens because of the importance of urban green spaces as nodes of contact with nature. Coley et al. (1997) found that natural elements, such as trees located in semi-public spaces surrounding urban housing, promote increased use by, and interaction between, residents. Urban green spaces that are well used have been shown to encourage bonding between neighbors, provide a greater sense of safety and reduce urban ills such as crime and violence’ (Home, et al., 2010: 495).

The author also asserts that open green areas can also reach the status of recognised architectonic landmarks that can even provide spiritual support

(Home, et al., 2010). At a metropolitan and regional scale, this understanding of open tracts as relevant landmarks has somehow found its place in some planning frameworks – such as the case of the ‘Ranstad Zone’ in The Netherlands, for instance – in which open green spaces are considered as significant elements of the history of the country. In the report named as ‘35 icons of Dutch spatial planning’ (2009), at least 17 of these icons refer to natural spaces – mainly pieces of suburban countryside – considered as valuable for the urbanised landscape and the entire society in socio-political, cultural, environmental and economic terms (Faludi, 2005).

### *Spatial/physical values*

Stamps and Smith (2002) argue that spatial characteristics of open spaces influence the sense of social security as they contribute to the sense of dominance and orientation. Open spaces can be controlled spaces as synonym of domination, security and control. Indeed, they contrast differences between closed and open spaces to highlight the relevance of the openness as factor of movement and control:

‘If a space is enclosed, then depth of vision will be restricted, it might be easier to hide, and it will be easier for something else to be hiding. Conversely, if a space is not enclosed, it will offer fewer opportunities to hide. Likewise, the abilities to move and to move quickly if necessary have obvious survival value. Freedom to move is limited by surfaces that block movement (such as walls) and enhanced by surfaces that allow movement (such as ground). Therefore, surfaces that either hinder or allow movement should be important determinants of impressions of dominance and enclosure’ (Stamps and Smith, 2002: 782).

In a metropolitan scale, the spatial relevance of undeveloped lands is determined by their physical characteristics and location to host new developments. In this vein, the land capacity and transport infrastructure appear as crucial factors to evaluate how much density an area can hold, what are their possible functions, regulations, physical restrictions and economic returns (McDonald and Brown, 1984; Kombe, 2005). The land capacity has been matter of debate – not only related to the land size – considering that small sites can also be relevant if they have good locations and land-uses, or if their regulations allow densities (Monclús, 2003). In some cases, well-served undeveloped lands become important as connector or as spaces not necessarily intended for new projects but rather

connectivity (Graham, 2000). In this vein, these undeveloped lands become 'infrastructural' and relevant for their capacity to connect other areas.

Characteristics of surroundings are also seen as factors of relevance for undeveloped lands. They can influence the different levels of marginalisation or integration and thus, their impacts or place in urban regeneration programs, infilling policies and others. If surroundings provide high consumption power, for instance, undeveloped lands become attractive to provide services, but they are marginalised, deteriorated or high rates of social insecurity, undeveloped lands become less interesting for private investments but rather for public interventions (Susanti, 2009).

### ***Environmental elements***

From an environmental view, Barkasi (2012) argues that vacant lands and open spaces are crucial in the reduction of natural disasters, above all in highly densified areas without natural surfaces for draining storm water or for facing storm events. The author suggests that open spaces can be included in plans as elements of mitigations and safety as they provide natural drain and infiltration capacity across different urbanised areas. According to Barkasi (2012), vacant plots to perform soil taxonomy are relevant to document the capacity of the urban soil to retain infiltration and improve absorption. So, vacant lands are useful elements to address natural disasters as they can drain large amounts of water in storm events and others (Barkasi, et al., 2012).

### ***Ecological entities***

Following a similar idea, La Greca, et al., (2011), La Fortezza (2013), and Sandström (2002) assert that undeveloped lands are relevant for their environmental contributions. They can support innovations on protection of natural ecosystems – including wild-life, natural landmarks and open spaces – and not only on fringe/belts areas but also more densified suburban neighbourhoods. In that way, the status of undeveloped lands and open tracts as 'green-infrastructure' suggests a stronger place in planning agendas and a political treatment that suggests prioritisation and investment (La Greca, et al., 2011; La Fortezza, 2013; Sandström, 2002).

*Reactivation of land market*

The economic relevance of undeveloped lands is linked to impacts in land market. These impacts are related to their place in plans and regulations, locations and increments of value. In plans, many of them are seen as able for new developments and labelled for future expansion. Also, they are planned to developed new infrastructure at different scales that also attract new private and public investments (Bruinsma, et al., 1993; Graham, 2000).

Undeveloped lands are also considered as scenarios of speculation, above all those served by high quality infrastructure or near consumption areas. More unregulated spaces – such as conurbation zones – are also seen as attractive due to their flexible land-uses and landscape (Graham, 2000). As financial commodities, Clawson (1962) early detected the resistance of suburban farmlands to become urbanised as they catch value over time. He identified ‘pending lands’ used to artificially raise their values (Clawson, 1962). In a different vein, Thomas and Walsh (2004) argue that suburban open spaces are key elements for valuing surroundings due to their environmental properties. This suggests that areas with high rates of expansion, good quality suburban open lands can work positively in reactivating the land market increasing values of surroundings, their own values or becoming attractive for future developments (Thomas and Walsh, 2004).

As seen, undeveloped lands of urban sprawl are determined by different factors, in a varied geographical distribution and manifested at different scales, functions and levels of relevance according to their social, economic, environmental and instrumental values. As seen, the unbuilt geography of urban sprawl is varied and composed by a wide range categories – all different in their contents, role and implication in the suburban performance. In some cases, the unbuilt suburban geography and its spectrum of undeveloped lands could be even define a much more varied environment than the relatively standardised suburban landscape (Figure 4).

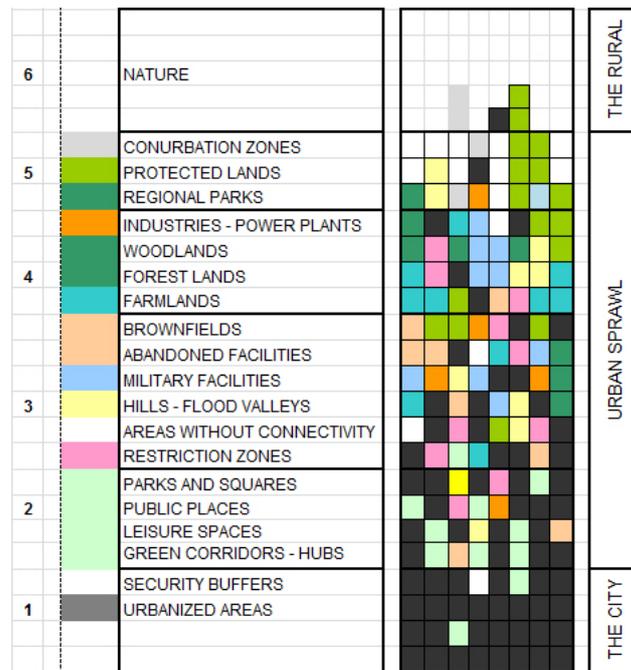


Figure 4. The spectrum of undeveloped lands of sprawl (author's diagram)

## 2.6 CONCLUSIONS

The debate on urban sprawl has been mainly focused on the built-up space. However and as seen, it is also determined by the presence and characteristics of undeveloped lands. These lands – that determine the fragmented nature of the suburban landscape – configure an unbuilt geography that contributes in defining urban sprawl as an ambiguous territory of transitional, pending or simply unexplored dimensions.

Despite the lack of literature related to this unbuilt suburban geography, the production of undeveloped lands, their morphological diversity, functions, categories, relevance and possible implications have been increasingly recognised by their ecological, political, economic and social contents and thus, deserve a closer inspection as constitutive elements of a framework that improve the comprehension of the unbuilt suburban space but also the urban sprawl phenomenon.

The various types of undeveloped land highlighted in this chapter have a multitude of origins, contents and interests associated with them. They are co-determine the patterns and processes of urban sprawl. The origin, content and the interests associated with such spaces are explored in concrete terms with regard to the Santiago de Chile case in chapter 5.

### **3. INTERSTITIAL SPACES: TOWARDS A FRAMEWORK FOR ANALYSING THE UNBUILT LANDS OF URBAN SPRAWL**

#### **3.1 INTRODUCTION**

As seen in the previous chapter, debates on urban sprawl remain strongly focused on the built-up space as main object of study. Nevertheless, undeveloped lands are also relevant and influence the suburban performance and planning at different levels (Gasler, et al. 2001; Northam, 1971; Pagano and Bowman, 2000; Maruani and Amit-Cohen, 2007; Sieverts, 2003). Despite this, they remain undefined and somehow excluded from the literature and thus, deserve a more explicit attention as active elements of urban sprawl. In this vein, the attempts to define undeveloped lands are varied, partial, in some cases ambiguous or simply do not refer to directly to urban sprawl. These, however, illustrate different potentials and differences of suburban unbuilt spaces, and also commonalities that allow developing a more comprehensive framework to operationalise the understanding of the unbuilt suburban geography and its different elements.

This research proposes a more embracing framework that considers previous conceptualisations, but also empirical factors related to the determinants, the different aspects and implications of the unbuilt space and its components in understanding urban sprawl. In this vein – and assuming the heterogeneity of the unbuilt suburban geography – in this chapter the term ‘interstitial space’ is introduced to refer to any sort of undeveloped land or sprawl and as a seminal component of the ‘interstitial territory’ to describe any expression of the unbuilt suburban geography. This term is presented in regard of previous conceptual antecedents, the analysis of relational character of undeveloped lands, the scales in which they are manifested and implications in planning.

#### **3.2 BEYOND UNDEVELOPED LANDS**

The planning literature has hardly addressed the presence of undeveloped lands considering a varied categorisation that ranges from totally empty spaces to those with certain degrees of densification. In this vein, different

terms refer to differing sorts of undeveloped lands but many of them appear as contradictory or only useful to describe a fraction of the wide spectrum of elements that compose the unbuilt suburban geography. So, ‘open spaces’, for instance, do not necessarily mean ‘undeveloped’, or ‘vacant land’ neither necessarily means ‘non-urbanised’. Thus, a critical revision of these approaches is still necessary in order to arrive to a more generic and comprehensive definition.

### **3.2.1 Critical antecedents to define the ‘interstitial space’**

Although some conceptual definitions for the elements of the unbuilt geography have been developed, they still emerge as partial or undefined, or do not disclose a dimension of urban sprawl in which the unbuilt geography is manifested. Thus, they neither allow operationalising the analysis of this unbuilt suburban geography nor its different elements.

In this section these terms are described and critically commented upon in order to finally suggest a more embracing conceptual approach that facilitates an analysis the elements of the unbuilt geography of urban sprawl.

#### ***The ‘in-between’ space***

Sieverts coined the term ‘in-between’ (*Zwischenstadt*) to describe the territory embraced between the consolidated city and the open countryside. The term does not refer to particular elements of the unbuilt suburban landscape but rather the scope in which the suburban geography is deployed. Sieverts argues that the rural/urban fringe area is a new form of city defined as neither urbanised nor the ruralised but rather an ‘urbanized landscape’ (Sieverts, 2003). This landscape is characterized by dispersed degrees of urbanisation and the presence of open tracts that still keep total or partial rural functions.

Sieverts is not the only author who describes urban sprawl as a different urban territory. In some ways, the literature on rural-urban interdependencies also describes this suburban fragmentation as a unique scope in which rural tracts coexist with urbanised areas increasing their

interdependency and suggesting different involvements in plans and regulations (Tacoli, 1998; Gallent and Shaw, 2007). In this vein, some planning initiatives recognise this ‘in-between’ territory as a different scope including suburban rural lands as relevant elements of the suburban geography. These are the cases of the ‘Five-Finger Plan’ of Copenhagen (Caspersen, et al., 2006; Galland and Enemark, 2012; Gravsholt, et al., 2006), for instance, or the regional planning initiatives for the Randstad and the ‘Green-Heart’ in the Netherlands (Bert, 1999; Kühn, 2003; Salet and Woltjer, 2009; Van Oort, et al., 2010; Lambregts and Zonneveld, 2004; Fazal, et al., 2012; Faludi, et al., 1996) and examples from the UK and others regarding ‘Green-Belts’ and the protection of the countryside (Gallent and Shaw, 2007; Tewdwr-Jones, 2010; Thomas and Littlewood, 2010).

So, Sieverts’ view of the ‘in-between’ territory vindicates the role of rural lands as positive elements of suburbanisation but the term emerges as an alternative description for urban sprawl, not specifically a term with which to inspect elements of the unbuilt geography.

### *Undeveloped spaces*

Undeveloped areas, undeveloped lands, ‘undevelopable’ lands and other similar terms are used to describe handicaps or physical constraints for urbanisation that affect the degree of sprawl (Theobald, 2001; Wolman, 2005).

The term refers to physically empty spaces irrespective of their functionality. So, farmlands and others can fit in these categories as well as some industrial plots. Indeed, these undeveloped spaces can show some expressions of urbanity not only due to their proximity to suburban areas but also for their symbiotic rural/urban functionality. So, open farmlands, for instance, can be accessible areas for public visits, tourism, technical specialized schools, leisure places, for massive encounters and others but nevertheless understood as ‘undeveloped’. At the same time, urban surroundings define functional routines related to the countryside and supported by some facilities such as zoo parks, traditional schools, research

centres, educative parks and others. Undeveloped areas close to the city are a backyard for many urban residents and at the same time, urban areas and infrastructure offer to rural resident alternative workplaces and access to cultural activities (Van Leeuwen and Nijkamp). So, undeveloped lands can be ‘functional spaces’ although no signs of physical densification.

### *Vacant lands*

The term ‘vacant lands’ arises at the early twentieth century to describe undeveloped areas such as small spaces, geographical accidents, private or public properties, speculation lands or reserves for social services such as schools, religious and others, mainly associated with former industrial plots often reclaimed for regeneration or infilling policies (Ige and Atanda, 2013; Foo et al., 2013; Northam, 1971). This often illustrates a contrast between their productive past and current decay and pollution. All in all, these lands are seen as underused, abandoned, derelict, fenced, as brownfields, or partially destroyed or demolished (Pagano and Bowman, 2000).

But the term is not exclusive of industrial functions. It is also used for any area to be reclaimed or simply to refer to derelict lands, manifested in different forms. According to Northam (1971), these ‘vacant lands’ can be classified in different types. First, ‘remnant parcels’ generally refer to small lands useful for squares or parks. They include some geographical restrictions such as slopes, flood valleys and other physical constraints. Secondly, ‘corporate reserves’ that refer to parcels of land owned by business corporations to support future expansions. Third, ‘speculative areas’ that can eventually be sold or simply used as financial commodities and fourth, ‘open tracts’ to refer to lands owned by public (or semi-public) institutions as reserves for social facilities such as schools, religious or any other (Northam, 1971). As seen, ‘vacant lands’ is somehow melted with the idea of ‘undeveloped land’ and is often seen as to be revamped or as matter of urbanisation.

### *Open spaces as ‘cracks’*

‘Open spaces’ have been discussed as positive elements of the urbanised environment in terms of their social, environmental and economic benefits.

Environmentally speaking and as previously discussed, they are seen as key spaces to reduce impacts of natural disasters (Barkasi, et al., 2012). Concerning economics, open spaces emerge as areas for new developments if they are nearby transport infrastructure or services (Clawson, 1962; Bruinsma, et al., 1993; Graham, 2000). Socially and spatially, these spaces provide specific ‘features’ for making places singular and when they have integrated functions, encourage contact between people and reduces perceptions of insecurity (Stamps and Smith, 2002; Home et al., 2009; Kurz and Baudains, 2010).

However, a more negative connotation was posited by Loukaitou-Sideris (1996) who refers to ‘open spaces’ as fractures, discontinuities and socio-spatial disruptions of the urban fabric. This definition is closer to the notion of ‘residue’, and is often used to describe elements of deterioration metaphorically named as ‘cracks’, originated by any sort of architectonic inattention. These spaces can be found in urban centres in the form of parking spaces between corporate towers and others, or in the inner city in the form of abandoned parks and squares, or in areas between centres and suburbs defined by the motorways, commercial strips or industrial complexes. It also includes railway lines, waterfronts or any other spatial barrier (Loukaitou-Sideris, 1996).

### ***‘Wildscapes’***

‘Wildscape’ has been used by some authors to describe urban spaces that show different expressions of wildlife – flora and fauna – including built-up spaces such as abandoned buildings, ruins or unattended facilities. In particular, Jorgensen and Keenan (2012) define these spaces as any area or space – even buildings – in where city’s forces of control have not defined the space at all. It refers to spaces in which children and spontaneous activities can flourish, and illustrate usages and forms of occupation beyond those determined by formal plans. These spaces are seen as positive due to their socio-environmental contributions, and as necessary for contrasting the advanced levels of urbanisation in regions where residents are excluded from experiences with nature, flora and fauna. Expressions of ‘wildscapes’ are lakes, forest lands, ecological reservoirs, but also vacated and abandoned

spaces where nature has grown over time, or in where unplanned activities can take place (Jorgensen and Keenan, 2012; Kitha and Lyth, 2011; Aurora, et al., 2009; Geist, 2004). These lands are not necessarily part of suburbia as can be found elsewhere.

### *Wastelands*

In a similar vein, ‘wastelands’ are abandoned, marginalised and forgotten urban spaces characterised by exuberant flora and fauna with aesthetics and ecological benefits. Alluding to these spaces, Gandy (2013) developed the term ‘marginalia’ to describe wastelands in cities like London, Berlin and Montreal. These spaces emerge from former industrial facilities or landfills, or from abandoned lands. They are also described as spaces for scientific exploration due to their ecological properties, new expressions of urban wildlife, nature and emerging ecological contents. They offer strong sensorial stimulation considering particular aesthetics, functional flexibility for random expressions of freedom, spontaneity and some hints of history and novelty at the same time. According to Gandy (2013), the ambivalent condition of ‘wastelands’ appears as prolific scenarios to combine new cultural and scientific expressions of urban life, and ‘as practical challenges for the utilitarian impetus of capitalist urbanization’ (Gandy, 2013: 1312).

### *The ‘drosscape’*

The ‘Drosscape’ coined by Berger (2006) refers to wasted landscapes within urbanised areas determined by the array of spaces outside regulations and institutional norms. These spaces are emphasised as opportunities for urban design and landscape interventions and so, as spaces to be reincorporated to the city. They emerge as by-products of urban sprawl and as leftovers of economic declines particularly clear in American city-regions. These are undervalued spaces due to their pollution, vacancy, unprofitability or others, defined by their conditions as boundaries, and not fixed conditions to any functional performance (Berger, 2006).

### *The ‘interfragmentary space’*

The ‘interfragmentary space’ coined by Vidal (1999; 2000) refers to any open space within the city. This term is derived from Vidal’s definition of

the urban environment as composed of urbanised ‘fragments’ characterised by morphological, economic and social dimensions that suppose the presence of the ‘interfragmentary space’ as a logical outcome, also defined in similar terms (Vidal, 2002).

Although ‘urban fragmentation’ has been used as a synonym of ‘social segregation’ (Musterd, 2005; Low, 2006; Prévôt-Schapira and Cattaneo, 2008) and thus, the ‘interfragmentary space’ is seen as a social barrier, Vidal argues that it is not necessarily related to negative connotations as it does not suppose a coincidence of its different dimensions or a strict interdependency among them. For instance, a specific social group – that could be identified as a ‘social fragment’ – not necessarily coincides with the same area of land identified as a ‘physical fragment’. It means that a social fragment can occupy different portions of physical fragments or even it may be a sociological group without clear geographical boundaries and thus, the ‘interfragmentary space’ could be a transitional space between different dimensions instead of a barrier (Vidal, 1999).

So, the ‘interfragmentary space’ is defined by Vidal as ‘the field of relations where transitions between fragments are produced’ (Vidal, 2002: 147), and emerges as a different entity regarding the urbanised fragments. According to Vidal, ‘fragments’ are composed by a ‘core’ and a ‘field’ (that surrounds and connects the core), and the ‘interfragmentary space’ is placed outside the fragment’s fields. The ‘interfragmentary space’ appears as a zone of ‘reconciliation’ and as a distance that facilitates the recognition of the boundaries of fragments (Vidal, 2002). Regarding its intrinsic nature, Vidal argues that it does not have its ‘own identity’ as it depends on the predominant dimensions of its surroundings, which could be structural, morphological, ecological, economic or social. So, the ‘interfragmentary space’ modifies its contents according to transformations of its surroundings (Vidal, 2002).

In terms of origins, the ‘interfragmentary space’ is an outcome of five types of relations between fragments: ‘an overlap of fragments, a suture, a third overlapped element, an immersion of fragments and a space of networks’

(Vidal, 2002: 152). Paradoxically, these types of interfragmentary spaces refer to different architectonic scales – except for ‘network creation’, which appears to refer to the sort of urban scale that is the focus of this thesis.

Going further on understanding this type of interfragmentary space, the author signals it as useful to describe spaces physically separated but connected by different infrastructures:

‘It is why we thought that it is suitable to consider “networks” as a fifth mode of inter-fragmentarity: fragments physically distanced but joined by lines, channels, mains, pipes, elements in movements. The network allows exchanging information, people, goods and circulation of commodities. It may get the form of communication channels or a strategic system of elements on the territory’ (Vidal, 2002: 156).

But the ‘interfragmentary space’ does not determine its condition only based on physical ‘distances’ but rather the relational character defined by the elements that interconnect its surroundings or its own components:

‘Often, the inter-fragmentary space of networks appears overlapped in the immersion field because of its social or physical characteristics. It is important to highlight that the physical distance is not a *sine qua non* condition for networks creation; a communication network could be useful to link fragments even when these could be beside one another, but the interchange is disrupted by an intermediate element. This is the case, for instance, of two neighbourhoods separated by a railway line but connected by telephone lines, a footbridge, a tunnel or a bridge’ (Vidal, 2002: 157).

Examples of interfragmentary spaces of networks are the conurbation zones connected by motorways and railways services, for instance (Batten, 1995), or suburban neighbourhoods crossed by railway services. So, based on Vidal’s definition, the ‘interfragmentary space of networks’ can include a certain degree of development and can be located in any area of the city.

### ***‘Non-urbanized areas’ (NUAS)***

This term refers to undeveloped lands determined by their ecological composition and natural landscapes. It highlights all possible ecological contents – including from agricultural to any kind of green infrastructure. It is possible to find intervened NUAs – such as parks, squares, rivers, canals, forested roads and others – and also natural inner spaces without signs of intervention.

As defined by nature, NUAs appear as environmental elements – in technical and political terms – recognised by their biochemical and socioeconomic relevance in supporting sustainable development and ‘ecological modernization’ (Thomas and Littlewood, 2010). In terms of land-zoning and regional policy, NUAs have been included in plans due to their benefits at local, regional and even global scales in debates on global warming and impacts of urbanisation.

More specifically, La Greca (2011) describes NUAs as spaces that provide ecosystem services and thus, as elements that must be included in planning. The author argues that NUAs have a fundamental role in addressing urban pollution, climate change and improvement of urban conditions:

‘NUAs are strategic both for pollution minimization and climate change adaptation. In land-use planning they should be carefully considered since they can give a contribution to the enhancement of urban settlement quality and to the improvement of human health. Several environmental, social, economic and cultural benefits can derive from agriculture and green infrastructures in urban areas’... ‘This is especially relevant in those planning systems that do not have criteria specifically targeted to NUAs and that consider them as generic farmlands or undefined urban green spaces’ (La Greca, et al., 2011: 2201).

From environmental, educational and scientific perspectives, NUAs are useful to study different forms of wildlife as they encompass relatively high levels of biodiversity, including endangered species found in urban forests and constitute valuable gears of ecosystem services (Alvey, 2006). In a similar vein, Savarda (2000) argues that biodiversity in urban ecosystems hosted by NUAs have positive impacts not only in the general enhancement of quality of life but also in social education and the general social culture (Savarda, et al., 2000).

Although NUAs may include ‘planned’ spaces – such as parks and squares – these are highly criticised by their aesthetic emphasise that sometimes alter biological properties and so, threaten their intrinsic character as ecological elements. In this light, Gandy (2011), for instance, highlights unplanned NUAs in Berlin’s suburbs as sources of biodiversity in contrast to those institutionally planned/managed:

‘The site is aesthetically and scientifically much more interesting than the closely managed municipal park to the north side of the street with its short turf and widely spaced trees. The urban meadow is an example of what the urban ecologist Ingo Kowarik terms *fourth nature* that has developed without any human design or interference to produce a new wilderness’ (Gandy, 2011: 150).

In a similar vein but regarding their potentials as ecological and socio-cultural legacy, the author also argues that:

‘...a unique medley of spontaneous landscapes has emerged over the last twenty years that provide a poignant symbol of urban possibilities. They reveal a city within a city that is not stage-managed for tourism or consumption, but open to multiple alternatives; a network of unregulated spaces within which both ecological and socio-cultural diversity can flourish. Although many of these spaces have now been lost there are still many interstitial landscapes that remain. Indeed, their eradication is not inevitable, as successful recent efforts to protect other sites across the city such as the meadows between the former runways of Tempelhof airport or the remarkable Sûdgelände nature reserve along an abandoned railway line attest’ (Gandy, 2011: 152).

Although NUAs are considered as gears of ecosystem services, many of them are nevertheless below the proper size to ensure the survivor of some species and thus, emerge as valuable for their social benefits. There are several examples of parks managed by local residents, volunteers, local councils, community groups and NGOs, suitable to apply social programs related to cultivation of vegetables, breed domestic animals and others for community engagement. Contributions are related to the provision of healthy food for residents, educational services, tourism, research activities, green-houses projects, clean energy supply and others (Saunders, 2011). Indeed, several assessment methods indicate that NUAs contribute to the conception of ‘wellbeing’ – including psycho-emotional and immaterial human needs – as environments that provide identity and security and as elements that offer open space in highly urbanised and homogeneous environments. (Wittig and Schreiber, 1983; Chiesura, 2004).

Reinforcing the social role of NUAs, Home (2010) asserts that a lack of NUAs implies a lack of possibilities to share common experiences that undermines the sense of community. The author asserts that NUAs have significant implications as nodes of contact with nature and social interaction (Home, et al., 2010) and have a similar status to architectonic

symbols, important for people to reach spiritual wellbeing and a collective definition of beauty:

'Godfrey-Smith (1979: 310) described a service that nature provides, from an anthropocentric perspective, as that of a cathedral. The cathedral role appears to be clearly cultural'... 'wilderness areas provide a vital opportunity for spiritual renewal, moral regeneration, and aesthetic delight. Danto (2003) pointed out that aesthetic judgments within a culture may be conditioned over time. For example, in early 18th century England gardens were considered beautiful when they were ordered into symmetrical patterns and mathematical figures. By the end of that century the comparatively wild "expressive" gardens had become the definition of beauty' (Home, et al., 2010: 496).

NUAs also provide open spaces that allow dominance and orientation that reinforce to the sense of security and safety (Stamps and Smith, 2002), provide spatial heterogeneity that support varied understandings of 'public' and 'collective' (Burgess, et al., 1988; Manzo, 2003; Sandström, 2002), and appear as multidimensional entities for the whole urban environment.

### *The 'non-place' of Marc Augé*

The debate around the term 'non-place' coined by Marc Augé (1995) has opened a wide range of interpretations regarding their empirical expressions in cities. Basically, it is used to describe social instances that encompass spatial and temporary dimensions somehow out of norms, plans, regulations, but more importantly as spaces without clear definitions in terms of identity, character or defined functions.

According to Augé (1995), to understand the 'non-place' it is important to review the notion of 'place' as natural opposite category. In short, a 'place' is not only a 'space' or a physical distance between two elements in the sense of 'vacuum', but rather a space with human interactions and culturally accepted functions that supposes specific events with specific temporalities. Conversely, a 'non-place' is a space in which there is no social interaction. Augé argues that 'non-places' are only functional time-space entities, only useful for specific non-social purposes. These 'non-places' are seen as outcomes of contemporary habits of modern life and arranged for temporary movements (spaces to 'pass through' instead of 'to stay'). 'Non-places' are described by hotels, sport spaces, aircrafts seats, highways, the roof where an advertisement is placed, bridges, the queue in the bank and the like

(Augé, 1995). In this light, many undeveloped lands in cities can be understood as ‘non-places’ considering the absence of social interactions and their transitional character. This can be the case of some buffers of security, for instance, or the space under a bridge or an elevated motorway.

***‘Terrain-vague’: the significance of abandoned places***

De Solá-Morales (2002) coined the concept ‘terrain vague’ [vague land] to describe spaces and buildings in a double condition: First, they are ‘vague’ in the sense of empty, without activities or functions, unproductive spaces, abandoned, obsolesces or in a stage of ruin, and second, they are imprecise, undefined, (a ‘form of absence’) without fixed limits or future destinations irrespective of their previous signs of occupation (De Solá-Morales, 2002).

The author highlights the importance of these spaces for the collective memory and social identity, and exemplifies their role through former industrial facilities as evidence of past heydays that although currently derelict or forgotten deserve attention on their socially meaningful character. In that sense, many undeveloped suburban lands take the form of ‘terrain-vagues’ – above all brownfields and other facilities – that were previously working as integrated gears of suburban transformations. It worth noting that it also refers to built-up spaces and so, the ‘terrain vague’ does not necessarily address the categories of undeveloped lands that are the focus of this thesis.

***Summary***

As seen, these antecedents refer to some specific types of undeveloped lands. Some of them can be found in suburbia but some others refer to the overall urban environment. Therefore, these terms are still insufficient to operationalise an analysis of the unbuilt suburban geography.

In the next section ‘the interstitial space’ is discussed and proposed as an umbrella term to refer to any kind of undeveloped land of sprawl, and to operationalise their analysis in empirical terms. This term – although it appears in the literature – has hardly been discussed. Yet with the further conceptual development offered here it is a term that emerges as more

embracing, unifier and generic, and allow referring to a wider categorisation of undeveloped lands, at different scales and contextual situations. *The notion of ‘interstitial space of urban sprawl’ deserves a closer inspection in order to address absences and contradictions determined by the diverse nature of undeveloped areas and open tracts, and to embrace the whole spectrum of vacant lands that determine the fragmented condition of suburban landscapes.*

### 3.3 DEFINING ‘THE INTERSTITIAL SPACE’

The term ‘interstitial space’ has been used in different fields of academic inquiry. It has been used in the planning literature to identify some sorts of gaps of the urban fabric in which informal, unregulated or unplanned situations take place, or to describe residual spaces left as a result of less controlled processes in planning.

To an extent the term interstitial is somehow in competition with the ‘in-between space’ used by Sieverts (2003, 2011), to describe spaces (or territories) placed ‘in-between’ others that are more clearly defined or structured. However, and as previously discussed, the idea of ‘in-between’ refers to sprawl itself, or as tangentially used, as places literally placed ‘in-between’ others. So, it is not entirely useful to describe more complex spatial expressions of urban sprawl in which elements that do not fit on ‘in-between’ conditions can be described. A conurbation zone, for instance, could not clearly be understood as an ‘in-between’ space as some of its boundaries can be still open, subdivided, and shows different growth directions or is container of several other gaps and spaces. It is also possible to find more three-dimensional combinations of undeveloped lands – and not simple adjacencies as the ‘in-between’ condition suggests – such as superimposed, overlapped or intersected spaces with differing levels of consolidation as suggested by Vidal’s concept of inter-fragmentary space.

What is clear is the fact that the term ‘interstice’: is more interdisciplinary, transversally placed in sciences; contains the ‘in-between’ condition but also; embraces the ‘out of the norm’ character that allows operationalising

different complexities and combinations of consolidated and unconsolidated elements, spaces or processes.

### 3.3.1 Critical connotations for the ‘interstitial space’

This term seems to be randomly used in the urban debate and less used on issues of dispersed suburbanisation. It has been indirectly invoked to describe scenarios of opportunities related to new urbanisations, functions and improvements in urban quality, as by-products of sprawl, or as areas to be revamped. Mohammadi (2012), for instance, referring to the case of Urmia asserts that: ‘sprawl leaves behind numerous *interstices* that may be used for other functions such as agricultural land or for infilling policies, although the former appears more important than the latter’ (Mohammadi, et al., 2012: 87). In a similar vein, Gallent and Shaw (2007) explain why rural/urban fringes has attracted the attention of policy makers – referring to ongoing reforms in the British planning system such as the Compulsory Purchase Act 2004 – and the opportunities to manage inherent complexities of these near-urban ‘interstitial landscapes’ (Gallent, and Shaw, 2007). Apart from the aforementioned, the term is also used to emphasise spatial instances as residual or as leftover spaces with social, political and environmental connotations.

#### *The interstice as a space of proximity*

At the smallest scale, Vidal (2002) uses the term ‘interstitial space’ to describe dynamic spaces delimited by physical elements such as buildings, walls and others. In Vidal’s words, the ‘interstitial space’ is:

‘...a changing space in motion and a signifier of the place's energy as it transfers important information about the meaning of the place. At any case, it is a mutation, and as a mutation it is a chance to create more space in the urban structure, as a sort of reservoir of space for future expansions of fragments or the inter-fragmentary space’ (Vidal, 2002: 162-163).

The ‘interstitial space’ here emerges to support transformations of the urban space. The author clarifies that the ‘interstice’ is opposite to a ‘residue’, a ‘remnant’ or a simple ‘vacuum’, because these categories represent something ‘obsolete, outdated, deciduous, hidden, forsaken, and as a consequence it is able to be in risk or to become a hazard place’ (Vidal,

2002: 164). Furthermore, and establishing the content of the ‘interstice’, Vidal asserts that ‘the interstice’ is a place in which different identities can converge, a place of individual and collective significance, a dynamic place that can change its own condition in regard of its boundaries. Finally, Vidal posits that the ‘interstitial space’ is a spatial entity that provide a better understanding of the scale of proximity, and even smaller spatial configurations such as the cracks in a wall, in buildings or the difference between the step level between the street and the sidewalk (Vidal, 2002).

In a different vein but also regarding proximity, the ‘interstitial space’ has been used to describe alternative social practices in undefined architectonic spaces. Steele and Keys (2015) argue that the attention on ‘interstitial spatial practices’ suggests further improvements on social housing policies, for instance. They identify ‘interstitial spaces’ defined by architectonic elements such as pavilions, patios [yards], corridors, balconies, doors and windows, and through this, they explore everyday housing practices at domestic scales. For them, the ‘interstitial space’ is usually an ‘uninhabitable’, undefined, uncertain and flexible space, an instance in which spontaneous activities can take place (Steele and Keys, 2015).

#### ***The interstice as a space for installations***

More technically, this term is used in architecture to describe small spaces in buildings between walls or floors, and intended to host energy lines, pipes, plumbing systems and others. These interstitial spaces leave installations protected and isolated from liveable spaces in accordance with safety norms or other restrictions and provide independent space for easier access to mechanical systems, reparations, replacements, and maintenance. This is a compulsory space in medical and scientific architecture that imply hard requirements of ventilation, cleaning, fire norms, rigorous maintenance and operations commonly required in hospitals, laboratories, industries or military facilities (Vondrak and Riley, 2005; Verderber and Fine, 2000)

#### ***The interstice as an unregulated place***

Gandy (2011) used the concept ‘interstitial place’ to describe unregulated inner urban spaces. These spaces are identified as ‘wild’, ‘unregulated’ and

mostly characterised by the presence of nature and ecological properties. They embrace aesthetic and scientific significance because of the presence of micro-climates, flora and fauna and also spatial conditions that reinforce the image of natural heritages and outdoor environments. These ‘interstitial places’ have valuable information about trees, local grass, natural stones, meadows, and other local knowledge transferable among citizens. The author stresses their potentials saying that the interstitial place ‘reveal a city within a city that is not stage-managed for tourism or consumption but open to multiple alternatives; a network of unregulated spaces between both ecological and socio-cultural diversity can flourish’ (Gandy, 2011: 152). In a sensitive description, Gandy highlights specific details of these places in which the presence of wind, the grass, humidity and others support wildlife, local knowledge on ecological benefits but mainly an atmosphere full of new aesthetic elements and outdoor reminiscences:

‘It is a warm July in Berlin. The aromatic white flowers of yarrow *Achilea Millefolium* stand out strikingly against the gloomy undergrowth of a patch of waste ground where the busy *Chausseestrassr*, running north-south, meets the *Quiter Liesenstrasse* from the east. Unnoticed the most of people walking past, this site is teeming with life as nocturnal insect dart about amidst the flowers and bats swoop occasionally from the trees. Among the interesting species found on this site is a subtly market moth, *Cucullia Fraudatrix*...’ (Gandy, 2011: 150).

These ‘interstitial places’ are not only found in suburbia but also anywhere in cities where regulations and institutional interests are still away and maintenance is still in hand of natural forces.

### *The interstice as wild space*

In a similar vein, Jorgensen and Tylecote (2007) assume that ‘urban interstices’ exist in cities as spaces for wildlife. So, woodlands, abandoned allotments, river corridors, brownfield sites and others emerge as proper sites for spontaneous growth of vegetation in contrast with those planned spaces with nature ‘under control’. They indicate that these spaces have significant contributions in facilitating direct contact of urban dwellers with wild nature at different scales, and open new possibilities for landscape planning and urban design. They coin the term ‘interstitial wilderness’ to reinforce the idea of how these spaces contribute to multiple human ecologies (Jorgensen and Tylecote, 2007). These ‘urban interstices’ are not

exclusive elements of urban sprawl, fringe/belt areas or suburbia as can be found anywhere in cities.

### *The sociological interstice*

In a sociological dimension, the ‘interstice’ is used by Brighenti (2013) in socio-political and spatial terms. The author appeals for the social relevance of the series of marginal areas useful to host alternatives reactions against official institutions or societal anomalies. The author insists on the idea of the ‘interstice’ as a gap within the socio-political establishment and those excluded from the societal project. Some examples are related to the role of the interstice to describe the spatial distribution of marginalised groups – such as gangs or homeless people – or as a boundary between socially differentiated groups. It is also understood as a disorganised environment that does not belong to the official private space, neither public, or to describe any crack in the structure of social organisation (Brighenti, 2013). So, the ‘interstitial space’ in this case is not only a matter of physical dimension but also social and serves as shelter or trench for social struggles and vindications.

### *The interstice for informality*

Also in a sociological dimension, Dovey (2012) uses the ‘spatial interstice’ to draw the attention on the spatial elements of informality: ‘the ways in which informal urbanism flourishes in the spatial interstices of the city and produces urban phenomena with a potent impact on the streetscape and urban image’ (Dovey, 2012: 352). The author highlights the ‘interstitial’ as expression of informal practices, events or activities in the public space – such as trading, parking, hawking, begging and advertising – tied to the also informal morphologies that support them. She also uses the term to refer to unused urban sites – informally invaded by specific communities – and the morphological aspects that allow such occupations. The author argues that informal settlements take a spatial position in cities as ‘urban interstices’ that defines a dialectic and incongruent image of differing rationalities in the production and uses of the urban space (Dovey and King, 2012). Here, the ‘interstice’ is an instance supported by morphological patterns that allow

social expressions at the margins of institutional controls, shaped by strong links with informal functions and community organisation (Dovey, 2012).

#### *The interstice as a creative space*

Shaw and Hudson (2009) refer to ‘interstitial spaces’ as scenarios for artistic expressions that are also reacting against formal institutional controls. They highlight the creative ways in which the ‘interstitial spaces’ are occupied and how they challenge the idea of ‘place-making’ and social order. On the one hand, the ‘interstitial spaces’ disrupt positively the homogeneous and controlled official urban space, and on the other hand, they also illustrate dimensions of marginality, dereliction or abandonment. These spaces are indistinctly used by either marginal or more structured groups but in any case have the potential to become scenarios for creativity and alternative expressions of social organisation (Shaw and Hudson, 2009).

#### *The interstice as a ‘zone of transition’*

Tonnelat (2008) assumes that for American cities, ‘urban interstices’ can be understood as ‘zones of transition’ in which immigrants learn about the local culture and obtain clues of adaptation to the American society before moving to more permanent residences. This situation takes place in various residual spaces between industrial facilities, roads, canals and the poor tenements occupied by workers. This vision is contrasted with the ‘European interstices’ in which residual and functionless (leftovers) spaces are seen as opportunities – often in the eye of professional design and landscape practices, closer to nature and wildlife – to encourage community empowerment and formalisation of the space (Tonnelat, 2008).

#### *The interstice as space for new developments*

From an urban design view, Sousa Matos (2009) understands that ‘interstitial spaces’ emerge as by-products of the uncontrolled urban expansion and thus, should be reclaimed for new developments, functions and activities. These spaces are residual, voids between fragments, spaces without appropriation, marginal lands, but with potentials to be reintegrated to the urban fabric. The author asserts that these spaces show some signs of activity and values that can be reinforced by new interventions. They are

recognised as empty spaces of the periphery but once ‘one penetrates the system of interstitial spaces and starts to explore it, one realises that what has been called “empty” is not so empty at all’ (Sousa Matos, 2009: 66).

*Considering these extant urban-scale approaches, ‘interstitial space’ has not been detected as a constitutive element of urban sprawl, even though the term seems to be more precise and conceptually more encompassing than others.* Its generic character to refer to all kind of undeveloped lands – irrespective of their functions, emptiness or density, potentials and implications – suggests a more comprehensive approach to those elements of the unbuilt (in-between) suburban geography and thus, it deserves a more precise conceptual analysis.

### **3.3.2 The meaning of ‘interstitial’**

Etymologically speaking, there is a consensus that the term ‘interstitial’ mainly refers to a space, a physical entity or an interval of time between two or more elements or events. It is intrinsically an ‘in-between’ condition that supposes the inevitable presence of surroundings – or at least boundaries – that confine its unitary nature. The term has been used to describe different situations – and at different scales – in a wide range of disciplines. However, it is rarely used in planning although has been practical to refer to urban spaces that emerge as ‘gaps’ within the urban fabric.

According to The American Heritage Dictionary of the English Language (2000), an ‘interstice’ is ‘a space, especially a small or narrow one, between things or parts’. In a similar vein, from the Collins English Dictionary (2003) the ‘interstice’ is ‘a minute opening or crevice between things’. The American Heritage Science Dictionary (2005) indicates that an ‘interstice’ is ‘an opening or space, especially a small or narrow one between mineral grains in a rock or within sediments or soil’.

In Physics and Chemistry, an ‘interstice’ describes special elements within the matter. This conception seems to be used since the 50s onwards in studies related to atomic energy, minerals and chemical reactions. In these fields, an ‘interstitial compound’ or ‘interstitial alloy’ is an element that

appears when an atom – of sufficiently small radius – sits in an ‘interstitial hole’ of a metal lattice and thus, becomes an ‘interstitial element’ (Wells, 1962). It is described as a sort of ‘mistake’ or ‘impurity’ in the context of pure elements. Indeed, according to Plumtree and Gullberg (1980), an ‘interstitial element’ is an impurity found in pure metals. These elements are small enough to fit in normal crystalline lattice locations, and can be introduced during the manufacturing process affecting physical properties of the metal (Plumtree and Gullberg, 1980).

The concept is also commonly used in biology and medical diseases to describe small spaces within organic structures. There is abundant literature that refer to ‘interstitial inflammations’, ‘interstitial fibrosis’, ‘interstitial lung diseases’, ‘interstitial pregnancy’, ‘interstitial tissue’ and other medical terms. In this light, ‘interstitial cell’, ‘interstitial compartment’ and ‘interstitial fluid’ seem to be shared by most of medical sciences as they refer to parts of the human body instead of diseases. The ‘interstitial cell’, for instance, refers to any cell that lies between other cells (Kaissling, et al., 1996). The ‘interstitial compartment’, is the space that surrounds the cells of a tissue. This area is filled with the ‘interstitial fluid’ (or tissue fluid), which is a solution that surrounds cells of multicellular animals. It is described as the main component of the extracellular fluid only possible to be found in ‘interstitial compartments’. This fluid provides a micro-environment that allows movement of ions, proteins and nutrients across the cell barrier (Fleischhauer, Lehmann and Kléber, 1995). Summing up, in these fields the ‘interstice’ is a sort of highly specialized environment in which only some specific elements (such as the tissue fluid) can be placed and only specific functions can take place.

In artistic practices, an ‘interstice’ refers to conceptual gaps between well-known categories or a superposition of several styles. It could be a hybrid outcome from a mix of artistic genres such as the mix between ‘fiction’ and ‘horror’ (horror-fiction) or others. Indeed, it refers to any artistic work that fixes ‘in-between’ rather than ‘within’ any familiar, defined or accepted category. Thus, an ‘interstice’ could be composed by two or more genres and so, complex to be categorised within a single one. This is the

case of ‘interfiction’ (interstitial fiction), for instance, that mixes different precepts of ghost stories and science inter alia (Soyka, 2007). Here, the ‘interstice’ is a new category emerged by the mix of others well-defined ones.

In Religion – and specifically in Roman Catholicism – an ‘interstice’ is a temporary condition. Specifically, it refers to the period of three months required between the diaconate and the priesthood ordination. It is clearly a period of time in which the person is introduced into a transition between its past and its future stage of formation (Hardon J. Modern Catholic Dictionary. 2007; H. Ahaus, in Charles George Herbermann, et al., The Catholic Encyclopedia. 1913).

In Computing Sciences and Internet, the ‘interstitials’ are small websites displayed meanwhile the main website is being loaded. These ‘interstitials’ are often used to display advertisements or to confirm agreements of terms and conditions before passing to the next website. Some of them could even get the status of a proper website considering information requirements. There are cases of interstitials that ask for personal details, passwords, or those to advise about payments confirmations before redirecting to the main pages (‘hyperstitials’) (Jansen, 2002). It is again an interval of time and ‘conditions’ that asks or delivers additional information to proceed.

These understandings offer a generic meaning, useful to describe spatial, physical or temporary entities that operates as connectors, intersections, in-between or transitional conditions and thus, more embracing of the various expressions of the elements that compose the unbuilt suburban geography.

### **3.3.3 The ‘interstitial territory’ and the ‘interstitial spaces’**

Moving the idea of ‘interstitial space’ forwards and considering the multifaceted nature of the urban environment, a brief discussion about the notion of ‘interstice’ as a ‘*space*’ or as a ‘*territory*’ is necessary to clarify how this term can be used to signal elements of, or the whole, unbuilt suburban geography. It can also clarify what are the geographical scales in

which the ‘interstitial space’ is manifested and its relational character to connect (or disconnect) different urbanised fragments in sprawl.

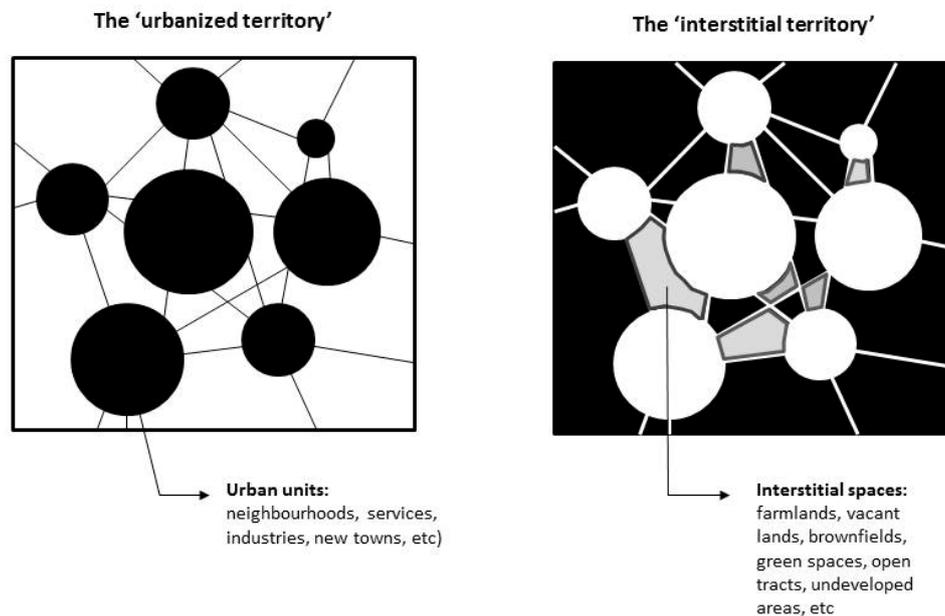
In this vein, the notions of ‘space’ and ‘territory’ have been used in social sciences from different conceptual entrances. On the one hand, there is a seminal distinction that describes the ‘space’ as a three-dimensional entity defined by physical boundaries and morphological characteristics, irrespective of its scale and functions. On the other hand, the notion of ‘territory’ suggests larger spatial scales and multiple layers that form its character including physical but also economic, geographical and geopolitical.

The distinction between these two terms has political implications as suggested by Lefebvre (1974) and the understanding of the built environment as a political scope. Lefebvre specifically proposed in *‘The production of Space’* (1974) that ‘territory’ implies concrete dimensions in which the entire society develops an evolutionary process of economic production and historical, social and cultural relationships between the individuals and their context. This is a complex socio-physical unit formed by ground, under-ground and aerial dimensions that even includes outer space in which a society exerts a degree of domination and rights. Conversely, the ‘space’ is a more abstract entity in which social and cultural dimensions are linked with different aspects of the territory (Brenner and Elden, 2009).

Incorporating the fundamental insights associated with this perspective, this research adopts the term ‘interstitial territory’ to refer to the whole unbuilt suburban geography as the field of study composed by several layers of socio-environmental occupation (underground, ground, spaces, air-space, outer-space) and in which the ‘interstitial spaces’ take place. Hence, the ‘interstitial territory’ is composed by ‘interstitial spaces’ as its generic units.

It is also possible to assert that the ‘interstitial territory’ emerges in a somehow opposed condition to the ‘urbanised territory’, also determined by different generic units: the built-up spaces (neighbourhoods, buildings,

infrastructures, etc.). Thus, any space or element that could not be considered as properly 'urban' would belong to the spectrum of 'interstitial spaces' that shape the 'interstitial territory' (Figure 5).



**Figure 5.** At the left, the urbanised territory composed by urban units. At the right, the 'interstitial territory' composed by 'interstitial spaces' (author's diagram).

It is also possible to assert that interstitial spaces are manifested at different geographical scales related to the stage of development of city-regions. These scales can have different impacts on processes of suburbanization and implications for planning. As discussed, interstices of proximity can support extensions at architectonic scales. However, metropolitan interstices are properly examined at the urban-regional scale with implications beyond local administrative levels.

### 3.4 THE SCALES OF INTERSTITIALITY

Based on theoretical and empirical evidence, the 'interstitial space' can emerge at different scales. Considering their diverse magnitudes and characteristics, they can describe several sizes, morphologies, functionalities, locations and surroundings that affect its scale's definition.

Morphologically interstices such as rivers, for instance, illustrate large and narrow spaces crossing through several districts with an intricate morphology. They describe a small distance between the two shores – a small scale – but at the same time entail a longer distance since a river

connects several areas of the city and beyond. Conversely, a large open space can be spatially large but nevertheless immersed in a single administrative area with similar characteristics. This can be the case of a metropolitan park that describes a large spatial scale but a single administrative one. So, the notion of 'scale' could differ from spatial, functional or administrative dimensions.

The scales of interstitiality are also related to the stage of development of a particular city-region. In monocentric environments suburban interstices appear as available spaces for residential extensions or available lands for new densifications, public spaces or services. In more polycentric regions interstices are related to agricultural functions, industrial or protected ecosystems not necessarily determined by planning instruments. Considering this, Maruani and Amit-Cohen (2007) describe how open spaces can be finally divided in groups differentiated by their scales, distinguished by their location and level of intervention. They identify four scales in which the interstices can be manifested: local (urban), metropolitan, regional (countryside) and national linked to wilderness, ecological properties and values (Maruani and Amit-Cohen, 2007).

In a similar vein, Douglas (2008) distinguishes the location of unbuilt spaces and undeveloped lands as widely distributed in fringe/belt areas, suburbs but also inner suburbs and the city centre. The author associates locations with different geographical scales and impacts. At the heart of larger cities, for instance, undeveloped lands represent different forms of prestige for new buildings expressed by protected green spaces, rarely changed (private gardens, community squares or small parks). At inner-suburbs, changes of vacant lands are not common and only occur when one building is replaced by another, or when a huge regeneration scheme is applied. In any case, most of the areas stay unchanged. In outer suburbs, changes occur more often as transformations are more intense – older buildings are replaced by new structures and open spaces decrease due to paving processes and impermeable roofs, and residential buildings are replaced by single family dwellings, retail and large offices. Finally, changes in peri-urban areas affect large urban/rural spaces where nature is

uprooted. In these spaces plants are removed, others imported (new species introduced), and finally green spaces increase value due to potential biodiversity, landscape design and ecosystem services (Douglas, 2008).

Thus – and including the architectonic expressions of interstitiality – there are at least five scales at which the interstitial space is manifested and can be defined: the scale of proximity, the urban scale, metropolitan, the regional and the scale of remoteness.

### ***The scale of proximity***

One scale in which the ‘interstitial space’ takes place is defined from the architectonic analysis. At this scale, spaces of ‘proximity’ appear as those compressed between different architectonic elements. Vidal’s definition of the ‘interstitial space’ (2002) exemplified the aforementioned by the space between buildings or a crack in the building’s façade (Vidal, 2002). However, this scale is not explicative of urban sprawl.

### ***The urban scale***

Regarding the urban space, Nechyba and Walsh (2004) highlight the importance of suburban open spaces in monocentric cities as significantly more important than open spaces in fringes. These interstices are placed at an urban scale and emerge as good scenarios for landscape management and urban design. These interstices are the likes of parks, squares, private and public spaces that facilitate contact with nature. They become attractors because of their access to natural views and amenities (Nechyba and Walsh, 2004). The urban scale illustrates well-defined suburban interstices in terms of amenities and community engagement but also are elements that are often well-addressed by existing planning tools and urban design proposals.

### ***The metropolitan scale***

This scale is placed on metropolitan stages of urban development that spans various administrative levels mainly determined by inter-communal connections. At this scale, the interstitial space involves several layers of administration – local, communal, intercommunal and central – and is confined by more than one territorial unit and so, suggests different

challenges in cross-territorial coordination. These are the cases of metropolitan parks, military and industrial facilities, large venues for massive encounters, zoos, landfills and brownfields, ecological areas or geographical accidents such as flood valleys or hills, all typically found in suburban sprawl.

### *The regional scale*

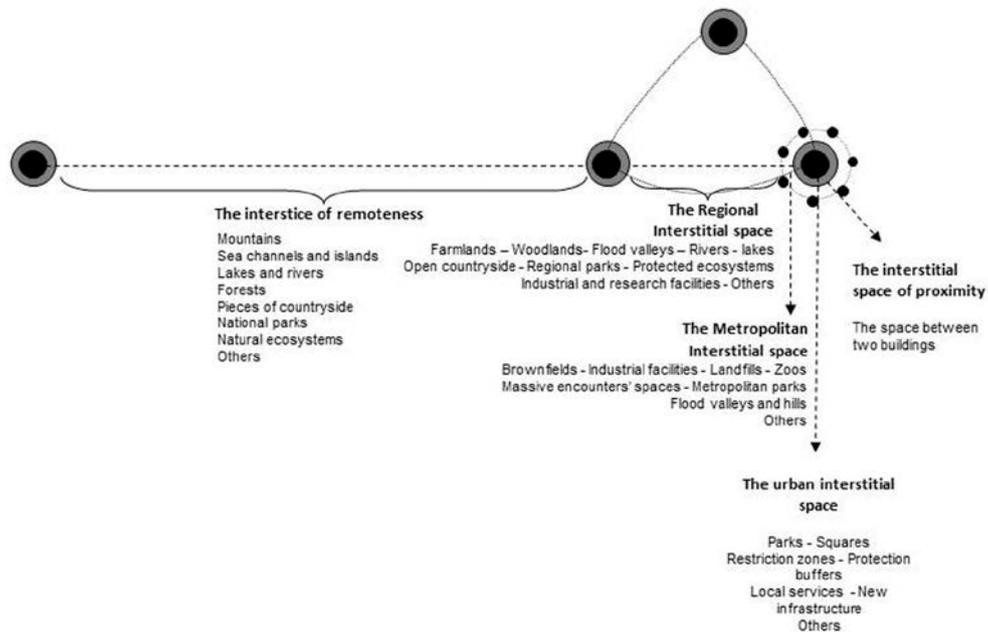
The regional interstice can be described as the space between two or more independent city-regions, satellite towns, or metropolitan areas with high degrees of sprawling expansion. These interstices often describe conurbation zones but also different expressions of large-scale suburbanisation. This space emerges as a ‘regional interstice’ and multiple institutional frameworks participate, not only those directly involved with the urban environment but also agricultural, industrial, environmental, infrastructural and others. This ‘regional interstice’ is exemplified by conurbation zones or the regional space in which different institutional representations take place (Batten, 1995; Morrison, 2010).

### *The scale of remoteness*

An ultimate scale is described by those spaces defined by remote distances between regions. These are geographical spaces of open countryside between different urbanised regions. These ‘interstices of remoteness’ usually embrace national (and in some cases multi-national) levels of administration several institutional representations. These interstices can be functionally interdependent and a matter of national or (inter)national jurisprudences. It is the case represented by the likes of national parks, protected ecosystems or geographical spaces defined by mountains, lakes, sea channels and others. Certainly, this scale does not usually illustrate urban issues but in some cases cross-national sprawling conurbations can take place on these interstitial spaces of remoteness.

The aforementioned scales encompass many manifestations of interstitiality – from proximity to remoteness – as part of different stages of urban development (Figure 6). However, not all of them are especially useful to the purpose of this thesis to examine urban sprawl and thus, it is necessary

to establish which of these scales are empirically operational as the ‘interstitial spaces of urban sprawl’.



**Figure 6.** The scales of interstitiality (author’s diagram)

### 3.4.1 Fixing the scale of analysis

All the scales in which the interstitial space can be manifested can describe a particular dimension of the urban environment. However, the scales that explain urban sprawl are the ‘metropolitan’ and ‘regional’ scales.

As seen, the scale of ‘proximity’, the ‘urban’, and the scale of ‘remoteness’, hardly touch upon the subject of suburban sprawl. On the one hand, the scale of ‘proximity’ clearly illustrates small spaces in which proper architectonic conditions are provided. Similarly, the urban scale is a more controlled, well-defined and largely static space that can be found in the inner city. On the other hand, remote distances between different cities are also pointless as they do not describe clear expressions of urban sprawl. Thus, the scales of ‘proximity’, ‘urban’ and ‘remoteness’ – although signalling interstices of relevance to other detailed subjects of study impinging upon both urban and rural development – are not considered as part of this analysis of suburban sprawl.

It is important to notice that, conceptually speaking and regardless the scales in which they are manifested, the ‘interstitial spaces’ are not inert or empty spaces. Some of them describe potentials, ‘bridges’, or specific modes of connection between urbanised fragments. So, the relational character of the interstitial spaces is deserving of discussion as it can also help to disclose the different degrees of integration between built and unbuilt lands and the implications for suburban performance; the extent to which urban sprawl as a whole – including its interstitial dimension – is only determined by the performance of its built-up lands.

### **3.5 THE RELATIONAL CHARACTER OF THE INTERSTICES**

The interstitial spaces of urban sprawl describe different degrees of integration with their surroundings that define their relational character. This relational character depends on spatial and functional aspects.

On the one hand, spatial aspects define suburban interstices in a range from totally opened to closed spaces. These spatial factors can be the outcome of natural conditions or interventions that result in different infrastructural elements. This is the case, for instance, of a rural interstice delimited by natural fences such as trees, water trenches or hills, and without any bridge, roads or pathways to penetrate into its internal area. In this case, the interstitial space is naturally closed and without any infrastructural intervention and so, illustrates a low relational character. Conversely, a similar rural suburban interstice but delimited by wood fences and provided with bridges and roads can define a higher level of relationality. Although it is also defined as closed, its infrastructural elements allow connections between its internal and external zones. In a similar vein, closed interstitial spaces can appear as non-relational at immediate scales but as highly relational at larger scales. A military facility, for instance, is a totally closed and restricted land and thus, its relational character regarding its surroundings appears as diminished. However, their inputs and outputs of information can be determined by their regional aspects. So, an interstitial space can appear as spatially isolated and closed but connected to outer spaces rather than immediate surroundings describing a more utilitarian character at regional levels. In this light, interstitial spaces can describe

simultaneously differing relational attributes depending on the scale of analysis.

On the other hand, functional aspects also influence the relational character of an interstitial space. Restricted activities such as industrial or those that require isolated conditions influence the degree of connection with surroundings. Although these spaces can be opened, they are finally inaccessible due to their functions. Conversely, accessible activities increase the relationality of interstices.

### **3.5.1 Spatial aspects of relationality**

As mentioned, spatial aspects define the open or closed condition of interstitial spaces, and the level of intervention determine their infrastructural performance. These two factors – open/closed and infrastructure – influence their relational character from totally non-relational to highly relational interstitial spaces.

As part of the spatial characteristics and infrastructural devices, boundaries' permeability, internal spaces and connections influence the degree of relationality. Thus, an interstice with permeable boundaries but without connection devices that link internal and external areas will not illustrate the same relationality in comparison to others with similar boundaries but with proper infrastructure.

The level of intervention – translated into infrastructural terms – also appear as a relevant spatial factor of relationality. As discussed, one sort of 'interfragmentary space' proposed by Vidal (2002) is those through which networks of infrastructure and action are operative in the movement of people and goods – beyond local surroundings. Specifically, Vidal's 'interfragmentary space of the network' illustrates this relational character based on infrastructural networks in which urbanised fragments are physically distanced but joined by lines, channels, mains, pipes and other elements concerned with promoting movement (Vidal, 2002). Nevertheless, these infrastructural elements are also seen as prime instances of 'placelessness', as they are simultaneously heavy infrastructures – such as

railways or motorways – that can transform interstices into derelict spaces or areas with certain degree of erosion that impacts on their relational character (Relph, 1976; Bruinsma, et al., 1993; Graham and Marvin, 2001). However, the presence of heavy infrastructure can also mean a benefit if interstitial spaces are properly recovered. As pointed out by Pagano and Bowman (2000) ‘the strategic reuse of urban vacant land and abandoned structures can represent a key opportunity for encouraging greater density and reducing the push to develop suburban greenfields’ (Pagano and Bowman, 2000: 1). In a different vein but still related to the infrastructural performance, the term ‘green infrastructure’ also carries with it this sense of how interstitial spaces are also forces of the integration for the urban territory (Kim, et al., 2015; Barbati, et al., 2013; Caspersen, et al., 2006). So, infrastructural conditions define interstices as links, connectors, bridges or effective interlocutors among different suburban areas and thus, contribute to their relational character.

### **3.5.2 Functional aspects of relationality**

Functional aspects of interstitial spaces also influence their relational character. These aspects are defined by the nature of their activities and functional intensity that affects the overall suburban performance. In Torrens’ words, ‘...areas of sprawling suburbs in active use are often interspersed among tracts of land out of active use, or with little functional use’ (Torrens, 2006: 249).

This functionality describes activities that require a certain level of closure, isolation or separation irrespective of spatial characteristics. These are the cases of military practices, industrial, or those that require exclusive and isolated land-uses. Although they can be spatially opened or connected, they nevertheless are restricted and non-relational and thus, illustrate lower degrees of relationality. Conversely, other activities such as farming, entertainment parks, ecological reservations or temporary uses that do not demand functional isolation, allow accessing into them irrespective of their level of spatial definition (Németh and Langhorst, 2014). These are the cases of some derelict lands informally transformed into sport pitches, recreational or public spaces, or ecological reservoirs used for educational,

touristic or social purposes. So, the relational character of interstitial spaces is determined by the combination of spatial and functional aspects (Table 2).

		SPACE			
		OPEN		CLOSED	
		NATURAL	INTERVENED	NATURAL	INTERVENED
<b>FUNCTIONS</b>	VACANT LANDS	PARKS	FORESTS	ENTERT. PARKS	
	DERELICT LANDS	SQUARES	ECO. RESERVES	LOCAL SQUARES	
	OPEN TRACTS		BUFFERS		
	FORESTS		ABANDONED		
	SECURITY SPACES	ORCHARDS	BUFFERS	CITY FARMS	
	HILLS	FARMLANDS		STADIUM	
	LAKES	ART. LAKES	GEOG.HAZARDS	SPORT PITCHES	
	BIKE PARKING				
	CAR PARKING		VACANT LANDS		
	BUFFERS				
			POLLUTED		
	CAR PARKING	VINEYARDS		MILITARY AREAS	
	INDUST. BUFFERS	CONURBATIONS	POLLUTED	LANDFILLS	
				BROWNFIELDS	
		INDUSTRIES		INDUSTRIES	

**Table 2.** Factors of the relational character of interstitial spaces (author’s table)

### 3.6 CONCLUSIONS

Critical antecedents to describe the unbuilt geography of urban sprawl are still insufficient, partial or simply not attuned to the specific issue of urban sprawl. The array of terms that currently exist in the literature is not embracing the whole spectrum of expressions, forms and categories of undeveloped lands and open tracts of the unbuilt suburban geography.

However, the idea of ‘interstitial space’ emerges as more embracing, generic and flexible, providing a more comprehensive theoretical framework to operationalise in an empirical analysis of the unbuilt suburban space and its components, determinants, role and implications in planning. Although hardly used in planning, the term ‘interstice’ is found in different scientific fields and is still plastic enough to describe and analyse diverse manifestations of undefined, ambiguous, unregulated or simply unknown undeveloped lands along with their unexplored contents. So, this term is adopted and developed here building upon contributions provided from an interdisciplinary perspective with a view to analysing components of the unbuilt suburban geography.

More specifically still, this chapter emphasized two important aspects of interstitial spaces of urban sprawl that will be taken forward into the empirical analysis found in chapters 7. First, the term interstitial is useful as it can encompass unbuilt lands found at different geographical *scales*. For the purposes of this thesis it is the metropolitan and regional scale interstitial spaces that are most useful to an understanding suburban sprawl. Second, the term interstitial also draws attention to the *relational properties* of unbuilt spaces and thereby also their centrality as co-productive elements within the process of suburbanization.

## 4. METHODOLOGY

### 4.1 INTRODUCTION

The research adopts the term 'interstitial space' to analyse the elements of the unbuilt geography of urban sprawl and to address the research questions aimed to determine what are these spaces, how they emerge and take part of suburban transformations, and what are their implications in planning. Assuming the varied range of interstices, the research examines several cases to enlarge the comprehension of the unbuilt geography of sprawl.

The capital city of Chile, Santiago, is chosen as a context of study in which seven interstitial spaces are selected to be analysed. Each case is examined in regard of its relational character and the scales in which is manifested, and selected by its relevance and different implications in planning. They are analysed using a mixed methodological framework (qualitative/quantitative) and data collected from reliable sources that include literature and policy reports, secondary research, original data collected in fieldwork.

In this light, the first objective intended to define the interstitial condition is addressed by the critical review of the extant literature and the empirical understanding of the interstitiality from different institutional actors. It specifically 56 semi-structured interviews to a wide range of institutional actors but also site visits and visual records to the different selected interstices. It also provide data regarding determinants, role and implications of Santiago's interstitial spaces. The second objective related to the nature of Santiago's interstices is addressed by a combination of statistical and qualitative data that provide contextual profiles in which interstitial spaces are manifested and their different scales and relational character. These data include social, physical, environmental, economic and political variables, diagrams and tables based on satellite images, maps, master plans and photographs. Finally, the implications of interstitial spaces in planning are also disclosed by empirical data collected in fieldwork focused on the series of political impacts in planning at different levels.

## 4.2 THE CASE STUDY APPROACH

Considering the variety of interstitial spaces and expressions of suburban patterns, this research adopts a ‘multiple study-case approach’ (Yin, 2009; Adams, et al., 1994; Flyvbjerg, 2006; Burawoy, 1991) to cover a wide range of cases in order to provide enough information to generalise conclusions (Yin, 2009). In this vein, Santiago de Chile exposes a varied array of interstices in terms of origins, functions and implications in the suburban performance and planning policies. These implications are defined by their impacts at different scales and their relational character that illustrates different levels of (des)integration and potentials for changing suburban trends.

The values of selected interstitial spaces are based on their variety that allows unveiling the implications of different categories of interstitiality – such as rural, agricultural, industrial, geographical, residential, industrial and spatial nature – with different scale impacts and relationality. They are identified by different actors as relevant and provide enough evidence to address the research aims. Selected interstices provide insights about their coexistence with residential surroundings and thus, their political implications in the sprawling development of Santiago.

The ‘multi-study-case approach’ is based on this varied array of cases that allows confronting previously postulated theoretical insights of chapter 3. This approach narrows the gap regarding potential weaknesses or strengths of a unique case in contributing to general knowledge (Flyvbjerg, 2006; Burawoy, 1991). In this vein and assuming cautions advised by Flyvbjerg (2006), this research is based on the idea that implications of interstitial spaces should be disclosed from several samples to cover the diverse spectrum that depicts the unbuilt suburban geography. Santiago’s sprawl emerges as a suitable context considering its dispersed and fragmented growth and the increasingly diverse array of interstices at metropolitan and regional scales. These interstices are defined by farmlands and pieces of countryside, military and industrial facilities, landfills and brownfields, green spaces, empty and underused lands, former industrial and military facilities, buffers of security (railways and motorways), geographical

handicaps and restrictions zones, conurbation areas, vacant plots, and open spaces *inter alia*. All the aforementioned emerge as embedded within the suburban expansion but nevertheless excluded from planning policies.

In contrast to this varied interstitiality, the (sub)urbanised landscape of the study area is practically homogeneous, defined by a long-standing standardised housing policy and transport infrastructure. This contrast helps to highlight interstitiality as a dimension that deserves a closer inspection in order to understand their role in Santiago's sprawl.

Data provided by different institutional actors and sources is sorted out following Adams's approach (1994) which suggests finding common links to construct an overall picture of the cases that configures the object of study and the context in which they are situated as matter of analysis (Adams, et al., 1994).

In particular, Santiago de Chile clearly expresses how dominant planning paradigms of 'command and control' are adjusted to produce suburbanisation – focused on built-up space – driven by the housing debate, and simultaneously how suburbanisation produces a series of interstitial spaces as an expression of less controlled processes in planning. This phenomenon is better illustrated by the southern area of Santiago that currently shows higher rates of suburbanisation triggered by flexible regulations and improvement in transport infrastructure, and a wide range of interstitial categories to be analysed.

#### **4.2.1 The context of study**

Santiago de Chile is a metropolitan area composed by 36 communes with a total population of 5,472,139 (INE, 2005). 'Metropolitan Santiago' is distinguished from the 'Metropolitan Region' – in which metropolitan Santiago is embedded – composed by 54 provinces that also includes rural villages and small towns (MINVU, 2014). This configuration is seen as an outcome of a constant 'expanded metropolisation' determined by the intensification of capitalist phases in which steady economic growth has induced the urban expansion and consolidation of disperse morphologies

(De Mattos, 2001). In this light, Santiago is a prime example of dispersed growth with clear impacts on the environment, social segregation, uneven distribution of services and infrastructure, proliferation of gated communities and gentrification, mainly driven by the housing shortage (Vicuña, 2013; De Mattos, et al., 2014; Inostroza et al., 2013; Inzulza and Galleguillos, 2014). In this context, the southern area has been the preferred location for social housing developments at inner and outer lands and improvements in infrastructure (Tapia, 2011; Hidalgo, 2007; Tapia, 2013; ODEPA, 2012; Boccardo, 2011; Salazar, 2010; Borsdorf, et al., 2007).

This sprawling growth of Santiago describes an increasing pattern of physical fragmentation (De Mattos, et al., 2014) in which a series of interstitial spaces emerge as a parallel geography that coexists with suburbanisation. These interstices are originated by different factors but with the arrival of new urbanisations enter in clear functional, economic, social, environmental and political tension and thus, discussed as spaces to be transformed or preserved. In part, the presence of interstitial spaces is determined by the main elements that explain Santiago's suburbanisation.

### *Santiago's suburbanisation*

In the last 30 years, Santiago's suburbanisation has been characterised by its housing policy, territorial disparities, emerging of sub-centres and regional fragmentation.

Regarding the housing policy, it is seen as one of the most successful in Latin America, defined from the 70s as direct subsidies to the demand and minimum construction standards to maximise benefits. It has been led by the MINVU and oriented to low-income families, and materialised by the private sector via a bidding system that considers land prices and housing construction. Most of social housing developments are located in outer rural lands being the southern metropolitan area the preferred location (Melo, 1996). Apart from its quantitative success, it generated a high concentration of poverty and social segregation characterised by a lack of services, green space, consumption power and connectivity (Rodríguez and Sugranyes, 2004; CONAMA, 2002; Ministerio del Medio Ambiente, 2011).

This long-standing process defined a clear contrast between wealthy areas in the North characterised by concentration of high-income population and high urban standards and poor areas in the South, traditionally seen as receptor of poverty and low-income population. This phenomenon finally impacted on the financial performance of southern municipalities and their technical and financial capacities (Orellana, et al, 2012; Reyes and Figueroa, 2010). So, Santiago's suburbanisation is functionally homogeneous but socio-economically differentiated.

Although this functional homogeneity, there are emerging patterns of sub-centrality defined by historical municipal centres – traditionally formed by a main 'plaza' [square], public dependencies, post offices, banks, commerce, churches and others – and the metropolitan relocation of commercial services such as shopping malls and improvements in transport infrastructure. In this light, recognised suburban sub-centres are the communes of La Florida (south-east) and Maipú (south-west) that attract local and external population. La Florida is characterised by one of biggest shopping mall that defines an important commercial cluster and Maipú is identified as a 'satellite city' currently conurbated with the metropolitan area (Truffello and Hidalgo, 2015; Escolano y Ortiz, 2005; Becerril-Padua, 2000).

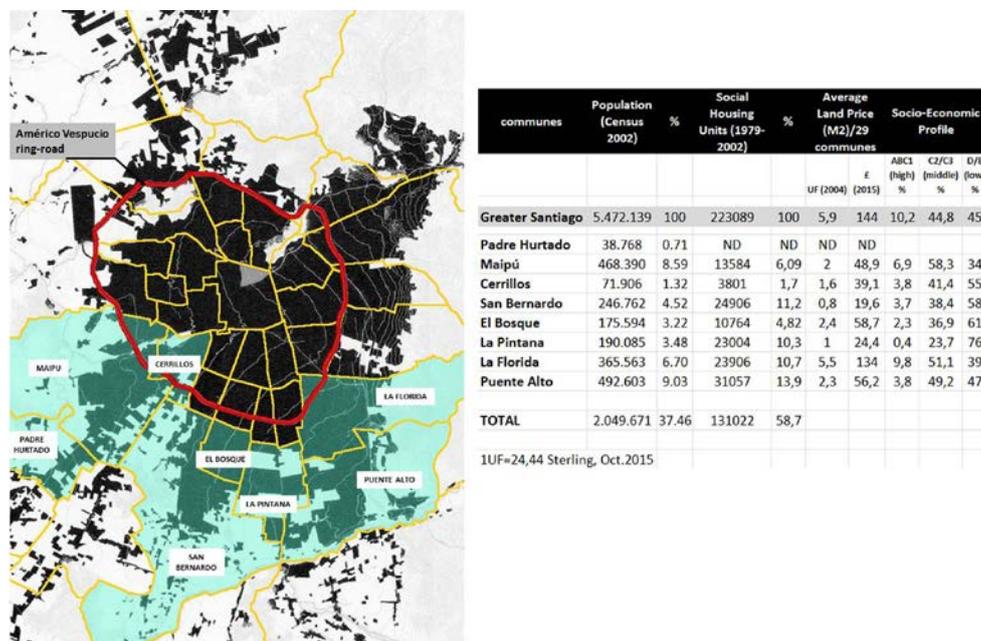
It is clear that the major concentration of social-housing developments, the emergence of sub-centralities and socio-economically deprived suburbanisation are placed in the southern expansion of Santiago and thus, this research is focused on this areas as a main context of analysis of suburban interstitiality.

### ***The southern expansion***

Santiago's southern expansion – as well as the rest of the suburban area – is placed beyond the Américo Vespucio ring-road, formally assumed as the boundary for the 'area of expansion' and currently extended to outer villages and small towns (Heinrichs, et al., 2009; Vicuña del Río, 2013; Ducci, 1998; MINVU, 2013). Specifically, the southern expansion shows

higher rates of suburbanisation determined by the high concentration of housing developments driven by cheaper land prices, physical feasibility and improvements on transport infrastructure. This area is characterised by a high concentration of poverty and social externalities such as crime, informalisation and of socio-residential segregation (Boccardo, 2011; Sabatini and Salcedo, 2007; Browder, et al., 1995).

This southern area is formed by 8 communes: Maipú, Padre Hurtado, Cerrillos, La Florida, El Bosque, Puente Alto, La Pintana and San Bernardo, concentrating 2.049.671 inhabitants that represents the 37,46% of the total population. It includes three of the most populated communes in Santiago: La Florida (365.563 inhabitants), Maipú (468.390 inhabitants) and Puente Alto (492.603 inhabitants) (INE, 2005). In the last 30 years the area increased its population and the urbanised area faster than metropolitan average growth (Ducci and González, 2006) and concentrated the highest number of social housing units (Tapia, 2011; Hidalgo, 2007) (Figure 7).



**Figure 7.** Santiago’s map and southern communes, and the statistics of social housing units (author’s figure based on Echeñique, 2006, MINVU, 2013; INE, 2005; Tapia, 2011; Hidalgo, 2007; Brain and Sabatini, 2006; AIM, 2008)

#### 4.2.2 The interstitial spaces of Santiago’s sprawl.

As mentioned, Santiago’s sprawl shows several interstitial spaces that compose its unbuilt geography. These spaces have different characteristics

and are considered as relevant by different institutional actors. What is clear, is the fact relevant interstices are all located in the southern area of expansion. Additionally, these interstices illustrate different categories defined by their conditions as geographical restrictions, private and public empty lands, industrial and infrastructural areas and agricultural lands. These spaces are manifested at different geographical scales and depending on their spatial and functional aspects define different degrees of relationality with the suburban context.

### *Geographical restrictions*

More generally, major geographical restrictions in Santiago are described by hills and restricted areas for urbanisation. They are labelled in plans as environmental zones, parks and recreational spaces. These are the cases of the ‘Cerro San Cristóbal’ [San Cristóbal Hill] in which the metropolitan Zoo is located, the ‘Cerro Santa Lucía’ [Santa Lucía Hill] identified as a metropolitan public space, the ‘Cerro Blanco’ [Blanco Hill] and ‘Cerro Chena’ [Chena Hill] in which is possible to find nature and elements of historical heritage. However, these spaces are not considered as relevant as their potentials for urbanisation are diminished precisely by their geographical characteristics.

### *Empty lands*

Empty lands appear in Santiago’s sprawl as financial commodities. In Chile, there are no impact fees for keeping a land empty and thus, owners can leave an area without development for years (Sabatini, 2000; López, 2011). Many of these lands are available for urbanisation and belong to both public and private institutional actor that used them to catch value or as reservoir for future urbanisations (Irrázaval, 2012).

### *Interstices in plans*

Several empty areas are defined in plans for future urbanisations. Generally, they support housing demands, infrastructure and services. However, many of these lands are not consolidated and remain empty, subdivided or simply preserved for agricultural uses or with low levels of functionality.

*Closed lands*

Another type of interstitiality is defined by several infrastructural lands with industrial uses, military installations or the presence of heavy facilities. They often describe closed or restricted environments with low levels of relationality, and high environmental impacts at different scales. Although this, some of them emerge as to be revamped due to their locations, land capacity and potential impacts in surroundings.

*Environmental spaces*

Open spaces are often identified as valuable for their environmental contributions. Specifically, pieces of countryside and suburban rural lands are seen as relevant for their space and landscape but mainly because of their environmental benefits – as reservoirs to host population evacuated from earthquakes, to face water storms events or as natural rain drainage in flooded areas with high rates of impervious surfaces (Reyes and Figueroa, 2010; Vásquez. and Weiland, 2011; Escobar, 2006). It also includes parks, big squares, open sport facilities and ecological areas, or other undeveloped lands such as farmlands, industrial or abandoned or lands.

The aforementioned categories of interstitiality describe a wide array of cases, scales and relationalities with surroundings, and are mainly concentrated in the southern expansion, confirming the importance of the southern area as scope of analysis of Santiago's interstitiality.

**4.3 METHODS**

The methodological approach is defined by the 'multi-study case' scope of analysis, the interdisciplinary nature of the interstitiality, and the involvement of institutional actors in defining and interpreting Santiago's sprawl and its interstitial spaces.

First, as a 'multi-study case' the methodological basis of this thesis ensures a wide range of interstitial categories are studied in order to allow a deeper comprehension of Santiago's sprawl and the implications of its interstitiality. Second, the research is posited as interdisciplinary as interstitial spaces collate issues of ecosystem services, political ecology,

green infrastructure and regional policy inter alia. Finally, understandings of institutional actors appears as relevant considering the ambiguous definition of the interstitial spaces and their differing negative/positive connotations.

The aforementioned determines the qualitative character of this research and the analysis of secondary data, and primary data collected from fieldwork – that includes 56 interviews with relevant actors, site visits and documents revision. It allows inductive analysis across cases, corroboration of first hand data collected, and the provision of conceptual themes to operationalise the analysis of selected cases and conclusions (Quinn, 2005). So, four methodological stages are considered: documents review, fieldwork, data analysis and concluding results.

#### **4.3.1 Documents review**

Documents review implies secondary research and institutional reports, plans and regulations, official media, policy reports, studies, projects, and statistical data. Newspapers articles are those strictly related to the case and based on reliable sources, specifically the newspapers ‘La Tercera’ and ‘El Mercurio’ – both of national circulation – from the 30s onwards as explicit date in which oldest cases appear as interstices in Santiago’s sprawl.

#### **4.3.2 Fieldwork**

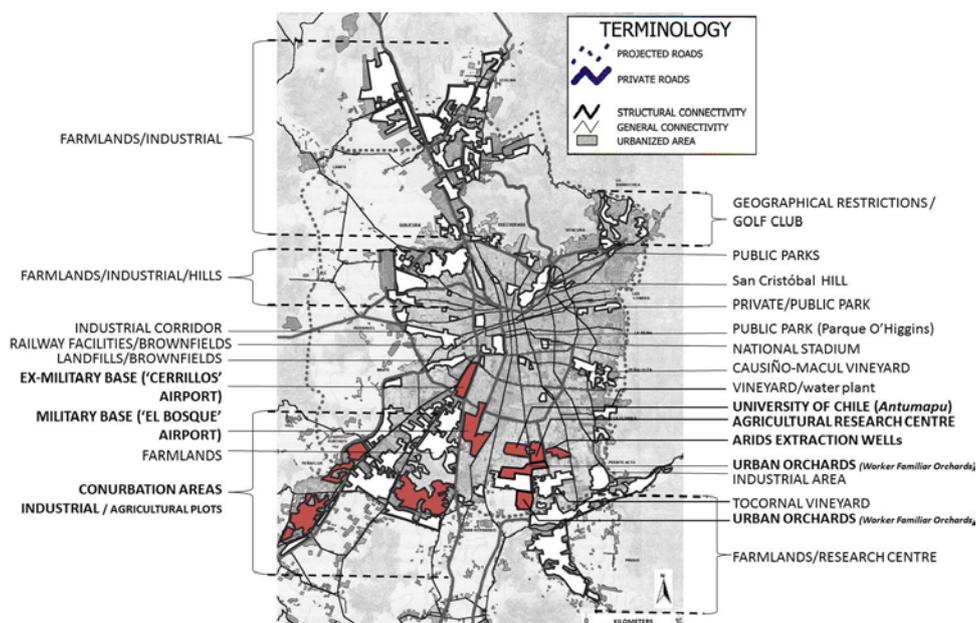
The research considers fieldwork as a primary source of information to obtain empirical data about Santiago, the southern expansion but mainly selected interstitial spaces. The fieldwork also implies data corroboration and adjustments with theoretical aspects in the light of empirical data.

#### ***Selected cases: relevance, scale, relationality***

As argued, the ‘multiple study-case approach’ allows collecting enough evidence of different patterns of interstitiality and information to generalise conclusions (Yin, 2009). It suggests a group of cases defined by different functional categories and identified by their relevance, scale and relational character.

Identified functional categories include infrastructural, rural, industrial, restricted, agricultural and conurbations zones. The criteria of ‘relevance’ is understood as context dependant considering the understanding of institutional actors. So, in interviews they were asked to identify the most relevant interstices and their values (*which one* and *why*). In general, this relevance was determined by the current situation of interstices – values and constraints – and also potentials for suburban transformations. Values were defined by socio-environmental and spatial properties and constraints by degrees of pollution, abandonment, functional obsolescence and informality. Potentials were determined by location, land capacity and surroundings.

These cases selected are shown in figure 8. They are: 1) the Cerrillos Airport site at Cerrillos commune, 2) ‘La Platina’ site at La Pintana commune, 3) Campus Antumapu site at La Pintana commune, 4) the gravel pits of La Florida, 5) the so-called ‘Huertos Obreros y Familiares’ [Workers and Familial Orchards] at La Pintana commune, 6) the military airbase ‘El Bosque’ at El Bosque commune and 7) the conurbation zones of Maipú-Padre Hurtado and San Bernardo-Lo Herrera. These two conurbations are understood as a single category in which the difference is that Maipú-Padre Hurtado are two independent communes while San Bernardo-Lo Herrera are two localities within the same communal area.



**Figure 8.** Santiago's map of selected cases (author's map based on Echeñique, 2006)

In terms of scale, and as discussed in the theoretical framework, these interstices are understood as metropolitan and regional. Also, their level of integration – spatially, functionally and institutionally – describes different relational degrees. For purposes of analysis, these cases are sorted by scale and relational character, deeply developed in the Chapter 7 including the evidence that illustrate their contents and implications in planning (Table 3).

STUDY CASES	
BY SCALE	BY RELATIONALITY
Cerrillos airport	The Orchards
La Platina	Military base El Bosque
Campus Antumapu	Conurbations
Gravel pits	

**Table 3.** Selected cases (author's table)

### *Site visits*

This research considers site visits to inspect by first hand spatial and physical aspects of selected cases via direct observation and visual registration. This is assumed as a proper technique of disciplines related to the built environment – such as architecture, urban design, planning and others – to provide a better understanding of existing conditions. This site visits' approach is based on Rayback's definition (2016) who posits that 'site visits' are necessary for making observations and measurements, and to test if a site meets the study goals. The author also describes different forms of data collection including notes, sketches, photographs, maps or others to determine whether the selected sites contain the necessary phenomena under investigation, and if the data is possible to be collected. It is useful for studies to carry out investigations of multiple sites in order to disclose similarities, to make appropriate comparisons or to determine common patterns and differences (Rayback, 2016).

Site visits are also particularly relevant in this research considering recognised inaccuracies in institutional recorded data. Furthermore, urban projects and interventions are implemented case by case before the existence of political frameworks or regulatory instruments. Also, there are some selected cases in which institutional records are restricted for

industrial/commercial purposes. Finally, site visits provide a more ethnographic approach for those cases that still show higher levels of occupation in which inhabitants appear as relevant factors that influence the socio-spatial composition of a place (Clifford, et al., 2016; White and Feiner, 2009; Shelby and Harris, 1985). This is the case for interstices that still host temporary or permanent agricultural, social and recreational uses.

### *Visual records*

In this research, photographs are used as tool for visual records due to their technical accuracy in general and detailed aspects of selected sites. It also offers flexibility of perspectives and mobility to provide specific (and original) views that highlight places' characteristics and their condition as interstices at human scale. In particular, in this research photographs are used as suggested by Collier and Collier (1986) – as 'visual evidence' – and as a way of contrasting maps and written records. It provides gathered data of spatial and physical components of interstices (Collier and Collier, 1986), and highlight socio-spatial specificities to address research questions and objectives (Roberts, 2016). In this case, photographs are used for selected spaces in equal terms, irrespective of their location, size or level of occupation. However, those more restricted cases – such as military or industrial facilities – are complemented by media, public data or visual records provided by institutional actors.

### *Interviews*

The research consisted of 56 semi-structured interviews conducted in Chile in 2014 with a broad range of actors to achieve a wide spectrum of views and information to address research questions and aims. These actors included private, public and third sector actors represented by politicians, policy-makers, technicians, public agencies, planning officials, architects and private consultants, developers and business groups, residents and community groups, socio-environmental organisations and NGOs, all selected for their first-hand knowledge on urban policies and its involvement in the study cases. The interviews were anonymised so that the respondents could be frank, without fear of professional repercussions. It aimed to obtain general and detailed data of Santiago's suburbanisation and

the selected interstices. Interviews' data was collated with reports, documents and recorded sources to confirm their reliability (Table 4).

	Type of Informant	N° interviews	Description and general subject areas	
Social, Political and Technical perspective	<b>Public Sector (central level)</b>	Ministry of Housing and Urbanisation (MINVU)	2	Ongoing policies and critical thinking about Santiago's development
		Ministry of Public Works (MOPT)	2	
		Ministry of Agriculture	2	Perspectives about the production of undeveloped areas within Santiago's sprawl
		Ministry of Environment	2	
		Government commissions, Regional Council (CORE) and Metropolitan Politicians	2	Situation and impacts of large-scale urban projects
		Politicians, Members of Parliament and Central Authorities (Senators, Deputies, Intendant)	3	
	<b>Sub-total</b>	<b>13</b>		
	<b>Public Sector (local level)</b>	Public consultants and professionals	5	Technical assessments, norms, regulations, Plans and land-uses, legal and economic constraints about Santiago's development and undeveloped areas.
		Municipal Planners	10	
	<b>Sub-total</b>	<b>15</b>		
	<b>Social representation</b>	Residents	8	Perspectives, impacts, visions, contributions, functions/uses about neighbourhoods and their undeveloped areas
		Public social organisations (central/municipal offices)	4	
		NGOs, Independent Social and Environmental organisations	6	Strategic undeveloped lands
	<b>Sub-total</b>	<b>18</b>		
	<b>Private Sector</b>	Private consultants and independent professionals	2	Perspectives and critical thinking about Santiago's development
		Developers, Real Estate Agents, Landlords, and Chilean Chamber of Construction	4	The presence of undeveloped areas and open tracts in sprawling areas and impacts
				Contributions and potentials of undeveloped areas and open tracts in suburban landscapes
			Master Plans, projects and Urban Design initiatives	
<b>Sub-total</b>	<b>6</b>			
<b>Academics</b>	Researchers, academics, Universities and Institutes	4	Secondary research and critical thinking about Santiago's expansion and the production of urban interstices	
<b>Sub-total</b>	<b>4</b>			
<b>TOTAL</b>	<b>56</b>			

Table 4. Informants, interviews and main subjects (author's table)

The purpose: Semi-structured interviews were used for two primary considerations. First, they are properly suited for exploration of actor's

perceptions and first-hand knowledge about selected interstices, and secondly, they allow adaptations to the variety of professionals, institutions, educational levels and personal stories that preclude the use of more standardised interviews' schemes. This approach is based on Barriball and While (1994) who argue that potentially varied study cases and actors deserve both flexible schemes of collecting data and structured stages to lead common subjects through differing levels of education, engagement or perception (Barriball and While, 1994).

Furthermore, semi-structured interviews are understood as a central tool in qualitative research and flexible enough to leave space to participants to offer new information regarding the topic, and to address issues not always seen as part of common consensuses, which is the case of several selected interstitial spaces. According to Galletta (2013), semi-structured interviews are particularly instrumental in opening up new possibilities in understanding complex phenomena often accepted as problematic. This flexibility appears as relevant in social sciences considering the array of layers of information and differing interpretations of the same issue, in this case, the interstice (Galletta, 2013).

Procedures: Interviews were conducted in the interviewees' workplaces or residences. These are assumed as secure places for both the interviewer and interviewee. Interviewees are anonymised to protect their identities considering the subject area supposes possible conflicts of interests or discrete management of information. Additionally, non-elite groups might be exposed to leverage or commercial interests or the other way round, commercial interests of economic actors might be compromised. These issues were presented, evaluated and subject of evaluation from the Ethical Committee of the University that finally approved the ethical aspects of the research (UCL Ethics Project ID Number: 5588/001. Approved 13 March 2014).

The interview process included the discussion of the 'Consent Form' and the 'Research Information Sheet' – that informed the contents and purposes of the research – timely described and advised beforehand when interviews

were arranged and properly signed by all interviewees. The ‘Consent Form’ includes permission to use the information for academic purposes and permission for voice recording.

Interviews were based on a sorted questionnaire designed to address the research questions and content analysis. In some cases, some of the questions were slightly changed to accommodate the interview to the interviewee's profile, subjects and interests, but also to include alternative information. In the same vein, some sub-questions were added to explore deeper in subjects or to clarify information. Depending on informants' expertise, subjects were varied in hierarchy but always led by research questions and aims. Additionally, and apart from primary information not previously registered or published, interviews disclosed emphasises and understandings about subjects involved, also collated with recorded data. Because of the context of the research, the set of documents and interviews are originally in Spanish, and then translated into English to be used in quotes, writing and research outputs. The questionnaire and a sample of a translated interview are provided in the Appendixes section of this research.

Adjustments: In accordance to different contextual levels – central, metropolitan, local – and also informant's profile, interviewees have been sorted in four categories: general informants, specific informants, primary and secondary informants. General informants give broader perspectives, opinions and visions to understand study areas as part of major situations. As Yin (2009) suggests, general informants provide additional sources of corroboratory or contrary evidence and initiate the access to such sources (Yin, 2009). In this category are former ministers, scholars, politicians, central authorities and policy-makers. Specific informants provide detailed and technical information to address specific subjects of the research and the selected cases. In this group are policy-makers, developers and local planners. Primary informants provide information from their own experience in policy making or related activities. In this group are residents, social organizations, policy-makers and planners, landlords, developers, urban designers and executives inter alia. Finally, secondary informants provide information based on secondary research, indirectly related – not

necessarily about cases – that complement the understandings of involved subjects. In this group are social organizations, NGOs and scholars. Some interviewees can hold a double role as general and primary, or a combination of any other.

### **4.3.3 Data collection**

Data collection is driven by research questions and objectives. As the research has descriptive and explicative levels, it inquires of *what* are these interstitial spaces – *how* these spaces are, *why* and how these spaces emerge, *what* are their implications in planning, and for *whom* they are expected for. These enquiries lead the literature review, semi-structured interviews and data analysis.

#### ***Organising information and contents***

The procedure to collect, organize and link the data is supported by a series of drafts organised by Mind Maps to visualise correlation of ideas, data and the general structure (Davies, 2011; Johnson and Shneiderman, 1991). These instruments supported the construction of content lists of this research and chapters, built upon a logical pathway of headings and subheadings that clarify the place of each topic/subject within the general structure. It allows applying critical revisions to see research gaps, constraints, misunderstandings and the relation between contents.

#### ***Software used***

Institutional documents and recorded press material is downloaded and archived in digital format, and sorted by subject. There are also technical files – maps and drawings – analyses by specific software (Adobe Reader, Autocad and ArcGIS) properly edited and classified. Media press records and the searching process are aided by electronic databases that allow downloading selected e-files applying filters of subject, year and impact factors in the public opinion.

#### ***Interviews contents***

Interviews contents are arranged by a research questionnaire under two premises: general questions aimed to address research aims, and secondary

questions to address complementary contents. It allows managing emphasises depending on the position of interviewees or their institutional representation to take advantage of their first-hand knowledge. Suitable environment for interviewees is assumed as interviewees' workplaces or living places, all agreed beforehand with planned appointments, and consequent signed consent forms that authorise using the information for academic purposes.

Interviews were conducted in an average of 40 minutes, in Spanish (as official language for both interviewer and interviewees), then transcribed and translated into English. As mentioned, the questionnaire has a flexible scheme to allow adaptation to different audiences – 'elite' and 'non-elite' interviewees – considering notorious cultural disparities between residents of deprived neighbourhoods and others (Richards, 1996).

### *Selecting key actors*

Considering the multi-study case and the interdisciplinary nature of the research, the general criteria for selecting informants is to embrace a wide range of institutional representations involved in planning and selected cases including expert and non-experts' actors.

More specifically, the selection considered the direct involvement on planning policies for the production of the built-up space – that draw the attention on the MINVU, for instance – but also those involved from 'outside' the built environment that sought the attention of the ministry of Agriculture and Environment, for instance, and others. Particular emphasis was given to policy-makers on the MINVU and local planners as they provided a techno-political data on general and communal suburbanisation of Santiago and its interstices.

Following the aforementioned, the selection of key informants is based on two criteria. First, the interviewee holds a relevant position in terms of technical knowledge, political or social representation, and second, the interviewees are people and/or organisations directly affected by policies,

projects or *de facto* situations related to selected cases. Finally, academics are selected by their research backgrounds on the subjects and cases.

#### **4.3.4 Data analysis**

Collected information is analysed based on a deductive process that derives in conclusions that cover the research questions. This involves several steps starting with a preliminary reading of the information to then sorting subjects, interviews transcriptions and content analysis, and selection of suitable quotations to support arguments or data that address the research questions. Interviews' content is analysed in form and substance, underlying ideas, meanings and responses patterns led by the questionnaire (Hsieh-Fang and Shannon, 2005).

Statistics have been provided by different sources, being the 2002 and 2012 Censuses consulted and analysed to support contextual descriptions. This was provided by the National Institute of Statistics (INE) of 1992, 2002, 2005, the National Socio-Economic Characterisation Survey (CASEN) and the official report of the Association of Market Researchers (AIM, 2012) for the socio-economic profile of Santiago's communes. Monetary information is specified, generally extracted in a unique date and transformed into Sterling to avoid distortions.

#### **4.4 CONCLUSIONS**

Santiago's urban development has been labelled as an instance of urban sprawl that includes the presence of several interstitial spaces. In this context, southern communes emerge as suitable to be inspected considering their rapid expansion, their role as main receptors of social-housing developments in the last 30 years and their diverse spectrum of interstitial spaces. Southern communes also embrace a wide range of institutional actors on planning issues but also on selected interstices to be analysed, and allows the inspection of different categories of interstitiality that provide enough data to address research questions. So, the methodology aims to provide a comprehensive framework to analyse Santiago's sprawl and its interstitial spaces. In particular, the revision of published material, interviews to relevant informants and visual records are crucial to

understand determinant, current conditions, potentials and implications of Santiago's suburban interstices.

Limitations of the research are related to contextual biases determined by some particularities of the area of study, the accuracy and restriction of the information related to some particular cases, restrictions to obtain visual records and the upgrade of statistical data. Regarding contextual biases, it is worth to notice that the southern area of analysis is characterised by the presence of vast zones of social-housing developments for low-income families. It somehow defines a certain degree of social and morphological homogeneity that differs from other areas. These differences can suggest conceptual restrictions in defining interstitial spaces as they emerge as determined by different socio-economic rationalities and cultural background. Nevertheless, this encourages further studies to enlarge the range of factors that determine the contents and meanings of suburban interstices. At any case, interstitial spaces are different to each other and thus, they nevertheless should be analysed case by case as well as the planning scope in which they are produced.

Regarding the accuracy of the information, it is worth noting that the last CENSUS (2012) was identified as inaccurate with international organisations arguing that there were serious methodological problems that invalidated the results. The INE suggests that the most reliable data corresponds to the 2002 CENSUS recommending its use as in this case. Nevertheless, statistical demographic and socio-economic information does not drastically change in Chile. It is also important to mention that military facilities did not allow free access to obtain visual records. This is the particular case of the aerial base 'El Bosque' at El Bosque commune. So, this case is analysed through the information provided by way of interviews with relevant informants, statistical and secondary research.

Another limitation pertains to the differing level of development of suburban communes which impacts on the provision of standardised and updated information, and lack of coincidence between different data sources. It also derived in difficulties in providing updated plans, maps and

regulations, and in some cases official representation to define interviewees. This was the case of Maipú commune – which resulted in delays in interviews with planners and the data provision, nevertheless solved by central municipal offices – and the municipality of Padre Hurtado that is still in a process of modernisation of physical facilities, plans and professional teams.

## 5. THE ORIGINS AND DETERMINANTS OF SANTIAGO'S SPRAWL AND ITS UNBUILT GEOGRAPHY

### 5.1 INTRODUCTION

This chapter is the first empirical chapter to provide original evidence related to Santiago's urban sprawl, its unbuilt suburban geography and the interstitial spaces that are part of.

Specifically, determinants of Santiago's sprawl and its unbuilt geography are deeply discussed to illustrate the series of factors, links and correlations that explain Santiago's sprawl as a context in which interstitial spaces emerge, and how they are manifested as outcomes of a planning rationale mainly adjusted to regulate expansions and individual initiatives, and the lack of planning tools to address the spectrum of inner suburban undeveloped lands.

What is evinced, is that Santiago's sprawl is not only driven by isolated factors of housing policies, land market liberalisation, improvements on infrastructure or suburban social aspiration but rather by a complex mix of them and other less evident determinants that define a planning rationale in which interstitial spaces emerge as closely related to urban sprawl, as unexpected outcomes of the increasing transformation of metropolitan Santiago into a city-region, and as a result of a series of political, economic and socio-environmental factors do not considered in planning.

### 5.2 DETERMINANTS OF SANTIAGO'S SPRAWL

Santiago de Chile shares common patterns of urban growth with most of the Latin American cities. These patterns, although recognised as a clear instance of urban sprawl, have been named as 'urban dispersion' (Heinrichs, et al., 2009), 'urban fragmentation' (Link, 2008), 'metropolitan expansion' (De Mattos, 1999), 'suburbanisation' (De Mattos, 2001) or simply as 'dispersed urban expansion' (Ducci and Gonzalez, 2006), and characterised by the fragmented suburban morphology, the permanent expansion to outer areas and the presence of a series of undeveloped lands (Rojas, Muñoz and Pino, 2013; Heinrichs, Nuissl and Rodríguez, 2009; Inostroza, Baur and

Csaplovics, 2013). It has been also criticised by its environmental impacts (Romero and Órdenes, 2004; Romero, et al., 2014; Weiland, et al. 2011; Gainza and Livert, 2013; Browder, Bohland and Scarpaci, 1995), residential segregation (Gainza and Livert, 2013; De Mattos, 1999; Sabatini, Cáceres and Cerda, 2001; Zunino, 2006), poverty concentration, territorial disparities, increment of travel times and inefficient land uses (Sabatini and Salcedo, 2007; Ducci, 1998; Ducci and González, 2006). Nevertheless, factors that explain Santiago's sprawl are diverse and interconnected, and placed on continuous policy improvements over time. For some, Santiago's sprawl is a historical phenomenon that reflects a steadily economic, demographic and employment growth, and is defined by a wide range of determinants that finally depict the intrinsic nature of the Chilean planning system (Interview 27; Gross, 1991; Echeñique, 2006).

### **5.2.1 Critical factors of Santiago's expansion**

Santiago's sprawl is determined by a series of interlinked factors and elements of a planning system that defines patterns of suburbanisation characterised by morphological fragmentation, socio-residential segregation, infrastructural and environmental aspects. However, it is widely recognised as relatively homogeneous as it is mainly defined by residential developments and as an outcome of asymmetrical relations between institutional actors and an uncontrolled land market. In this context, patterns of suburban diversification are defined by land-uses – that include rural and industrial – but mainly by the unbuilt suburban geography that contains a series of different interstitial spaces with different functions, morphological and spatial characteristics, geographical distribution and environmental properties. In this light, the empirical evidence confirms that Santiago's sprawl is a multidimensional phenomenon – composed by built-up areas and interstitial spaces – also seen as a critical feature of Santiago's sprawl.

Also and contributing to functional diversification, there are suburban areas recognized as increasingly multifunctional – determined by 'sub-centres' – in which a more polycentric character is being defined (Ingram, 2006; López, 2005; Ortiz and Aravena, 2002; Ortiz y Morales, 2002). In particular, one of these potential sub-centres is 'La Florida' commune – a

district commonly recognized by their commercial and public services – that that functional serves at local and metropolitan scale (Trufello and Hidalgo, 2015). The other recognised sub-centre is the ‘Maipú’ commune – known as the ‘satellite city’ – defined as an originally outer town currently conurbated with Santiago and included within metropolitan plans. Both of them are reinforced by services, workplaces, commercial facilities and a steadily population growth (Escolano and Ortiz, 2005; Rodriguez, 2012; Sánchez, et al., 2013).

Having briefly described Santiago’s urban sprawl, the determinants that explain its character are mainly linked to planning tools and policies adjusted to control impacts of fragmented expansion on peri-urban and fringe/belt areas. Some of these determinants can be found in other contexts and cities elsewhere – as elements of generic urban sprawl – but some others are specifically tied to the Chilean case.

### ***Policies, plans, zoning and regulations***

A first range of determinant of Santiago’s sprawl is defined by the elements of the planning policy framework. This embraces a series of regulations and tools that explain the different veins through which urban sprawl is being driven.

### **Expansion as the core of regulatory planning**

The general planning framework is conditioned by the constitutional role of the State and its planning instruments as a ‘regulator’ of public/private initiatives, and subsidiary of low-income families. This role was defined in the middle of the 70s, strengthened in the 80s and reinforced in the 90s until today, and understood as a prioritisation of scarce resources that found its optimisation in the location of low-income families and new suburban developments in outer rural lands – clearly cheaper – and a strong sense of ‘private property’ as a major social achievement. The idea was to provide basic houses defined by sanitization criteria – provided by minimum infrastructure (sewage, clean water, electricity and a toilet) – for people eradicated from streets, bridges, slums, and others extreme conditions of poverty (Gross, 1991; De la Puente, Torres and Muñoz, 1990; Valdivia,

Álvarez and Donoso, 2012). The financial scheme is based on the ‘subsidy to the house’ that would transform low-income families into private ‘landlords’ of small properties that would increase their values over time with the urban expansion (Interview 27). It determined the appearance of outer social housing developments beyond consolidated urban areas.

#### Low quality expansion and *de facto* situations

One of the contradictions of the aforementioned regulatory role in planning is that it is strictly defined for urban areas – properly indicated in plans – and thus, any outer development is regulated by centralised general norms. As the formal definition of an ‘urban area’ affects land prices, it stimulates outer urbanisations on cheaper lands to respond to public demands and private benefits. This situation determines the low quality of outer neighbourhoods, but also their functional consolidation considering flexible (or less regulated) restrictions for future growth, services and transport. Additionally, many new developments are made before formal permissions – arguing excessive bureaucracy, legal gaps, costs of studies and others – or under regulations not adjusted for urbanisations and expected to be updated later. So, urban regulation becomes an *a posteriori* process until the update of local plans, partial amendments in norms or improvements on infrastructure (De Soto, et al. 1988; Drake, 1996; Vallejo and Pardow, 2008; Garretón, 1982; Instituto Libertad y Desarrollo, Informe N°689, 2004; Kusnetzoff, 1987). This sort of ‘case by case’ pattern also leaves several undeveloped lands in between that finally affect the regulation of outer areas and the degree of physical continuity and transport provision.

#### Expansion by plans and regulation

Related to the aforementioned points, plans and regulations are also explicitly used to promote dispersed expansion. In several cases, local plans are updated to incorporate future growth beforehand. Areas for future growth are understood as ‘extensions’ (continuous aggregations of new areas) and ‘expansions’ (discontinuous aggregations of new areas) and conceived for different types of housing projects. Future extension/expansion areas have also included peri-ural towns and rural villages as matter of metropolitan plans. These are the cases of rural

communes of Lampa, Buin, Maria Pinto or Melipilla inter alia, that also require infrastructure of connectivity and public services (Interview 28; Hidalgo, 2007). These areas have been included in metropolitan plans from 1997 onwards and are mainly intended for social housing developments. What is critical in this involvement is the fact that most of outer developments are driven by both the MINVU and private developers and thus, defined as centralised actions – metropolitan instruments – that affect local suburban performances and regulations.

#### Centralised attributions and short-term priorities

Although plans (local/central) are defined as long-term instruments, they can be changed after presidential periods (four years), new central/local authorities, priorities determined by unexpected events such natural disasters, or regulation of informality. This flexibility relies on central attributions– specifically the MINVU – and is recognised as a major factor of transgressions of local goals. The MINVU can change land-uses of an area even without a local Mayor’s approval. Then, local plans should be updated in accordance to central priorities. On the one hand, this disparity is defined by centralised needs of responding to the social housing demand and the permanent rejection of communal authorities to receive more low-income population that finally impact on the taxation performance and municipal budget. On the other hand, local residents also want to reject centralized policies – perceived as disconnected from local needs – and redefinition of new urban limits as they foresee the relocation of social housing projects instead of services. This is a problematic issue when central authorities have 8000 families with approved subsidies but without available land. So, they should extend communal limits using legal attributions for including rural areas and/or re-locate people in nearby outer towns and villages and expanding the city anyway (Interview 24; Interview 56; Interview 32).

#### Centralised attributions and political alignments

Related to the aforementioned, communal urban growth is directly influenced by central authorities that localise social housing developments both inside and outside communal limits. In particular, the southern area of

Santiago has been the historical receptor of low-income families that defined vast areas of tax exemptions that undermine municipal budgets. It implies a series of social constraints related to security, public spaces maintenance, waste removal, street's cleaning, educational and health services and others that finally encourages local Mayors and residents to reject social housing and to redefine master plans to provide services. As a way of solution and to diminish local impacts, the MINVU locates new housing areas outside communal limits, but sooner or later it forces that update of plans to include new outer areas. This is a recognised 'central-authority expansion process' that is nevertheless seen as positive from private developers as they find positive stimulus for the construction industry (Interview 29; Tokman, 2006; Petermann, 2006). As a by-product of these centralised decisions, market conditions stimulate standardisation – similar targets and optimisation – that also affects local identities diversified by geographical, social and environmental characteristics (Interview 43). So, the built-up suburban landscape becomes homogeneous and only finds reservoirs of diversity on the array of still rural undeveloped lands and open tracts (Heinrichs, Lukas and Nuissl, 2011).

This centralised autonomy is seen as politically dependant on the profile, leadership and negotiation skills of public officers and authorities. If there is political alignment between central and local authorities, centralised decisions can be delayed, changed or compensated. Also, it could mean shared interests to change suburbanisation trends or to place local goals in the central agenda (Interview 20; Interview 22). Conversely, political disparities among suburban municipalities and central interests dissipate local or inter-municipal priorities and thus, again the legal centralised attribution define the pattern of suburban development. As a by-product of these (des)alignments, the metropolitan area is highly volatile to political terms and its urban performance – specifically the suburban growth – is widely recognised as an outcome of political circumstances, irrespective of plans or articulated visions between local and central actors. It also illustrates the different political consideration between suburban municipalities that affects the implementation of communal projects. In this light, planners, politicians and entrepreneurs agree that Santiago's suburban

development is a political issue – highly commanded by central interests – and only likely to be harmonised via local leadership and political alignment (Interview 19; Interview 21).

New figures (ZODUCS, PDUCS and AUDPS)

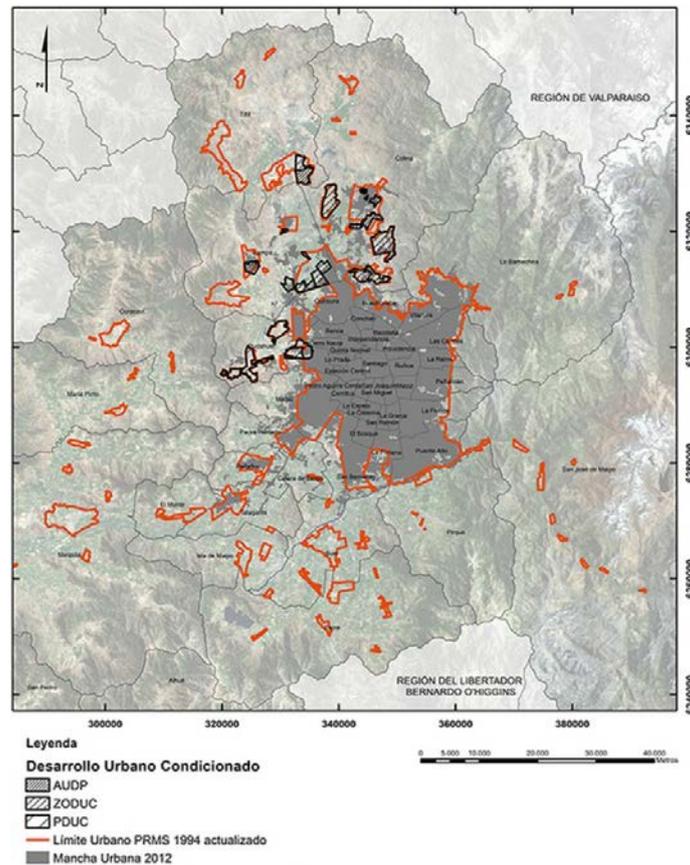
Santiago' sprawl is also determined by the creation of new regulatory figures for large-scale urbanisations beyond the urban limits, intended to compensate environmental, infrastructural and social impacts via the introduction of impact fees. Specifically, these figures were named as 'Conditioned Urban Development Zones' (ZODUC), 'Conditioned Urban Development Projects' (PDUC) and 'Prioritised Areas of Urban Development' (AUDP)<sup>1</sup> – first time introduced by the Regulator Plan of Santiago (PRMS) of 1997. According to the MINVU, a ZODUC should consider an area of 300 hectares, should leave a percentage for social housing developments, and include environmental mitigations and infrastructure of connectivity (MINVU, 1998; MINVU, 2014). These new zones are not located in extension areas – immediately outside the city and so, somehow contiguous – but rather further away, disconnected of the urban fabric and only connected by motorways or planned roads.

To implement these zones, the current PRMS/100 redefined the urban limit and included these outer areas as new available land for urbanisation. Considering the total size of the Metropolitan Region, a 45% of the land stock is labelled as AUDP, ZODUC and PDUC and thus, allows the creation of large-scale outer developments beyond suburban boundaries. In this scenario, real estate firms bought many of these lands and started the obtainment of construction permissions in well-served southern communes – such as Maipú and Padre Hurtado – and others such as Colina and Chicureo in the north and Pudahuel in the West, aimed to middle and upper class families. The idea behind the creation of these figures is to promote more multifunctional suburbanisation provided by transport infrastructure and internalisation of socio-environmental impacts. Despite intensions, however, local planers assert that when the PRMS/97 was defined –

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<sup>1</sup>ZOCUC, PDUC and AUDP were introduced in the PRMS/97 to apply impact fees on outer large-scale residential developments. After implementation, ZODUC were updated by 'PDUC' because the first only indicates a portion of land for social housing without compelling their construction. Thus, the area was left empty and expected social integration unachieved (MINVU, 1998; MINVU, 2014).

including the ZODUCs, AUDPs and others – communal authorities did not have updated information regarding the land market and thus, they could not claim for more proper compensations related to specific realities and unforeseen impacts or benefits. In this vein, central authorities and developers again defined the urban expansion aside from local interests (Interview 35) (Figure 9).



**Figure 9.** The Metropolitan Region, Santiago and its ZODUC, PDUC and AUDP zones (Instituto de Estudios Urbanos y Territoriales UC, 2012)

### *Transport infrastructure*

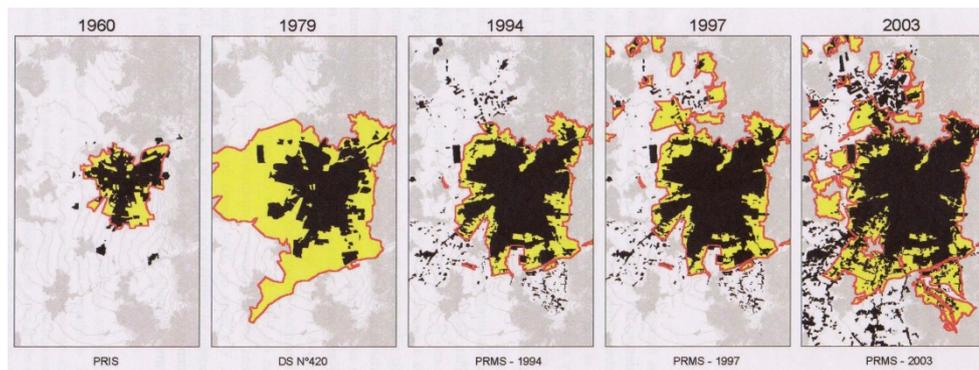
Santiago's sprawl is also stimulated by improvements in transport infrastructure that includes railways, underground extensions (METRO), motorways and roads. In several cases, the Ministry of Public Works (MOPT) should extend METRO lines to connect new suburban areas that show high concentration of population or create new connectivity to new areas. In the case of METRO lines, several areas near railway services are seen as strategic but underused (or undensified) regarding transport capacities (Interview 22). In this vein, new connected areas become attractive for new developments although spaces closer to high-speed roads

are restricted. Areas closer to stations are also seen as strategic and/or to be re-densified. Thus, after METRO extensions the urbanized area is also extended contributing to suburban expansion (Galilea and Hurtado, 2014).

### *The urban limit*

#### The creation and use of the 'urban limit'

A historical tool to control the urban expansion that paradoxically has stimulated suburban growth is the so-called 'urban limit'. It was introduced in 1953, but only in 1960 was legally authorised and applied in the first metropolitan plan called 'Intercommunal Regulator Plan' (PRI) (Petermann, 2006). However, since the 60s it has been permanently altered to include outer developments. So, for some the 'urban limit' is an unsuccessful tool as it does not stop the expansion and even works in a totally opposite way (Petermann, 2006; Evans, 2006; Schulze, 2010). According to López (1981) the 'urban limit' is a disturbing tool to stop the expansion as the division of a particular peripheral land in 'urban' and 'rural' by an arbitrary line increases its value without any condition or extra-cost for the owner. Additionally, land division encourages landlords to change functions of those portions outside the limit as their profitability increases with a real state project. So, the 'urban limit' has a paradoxical effect: while it tries to prevent uncontrolled growth and avoid encroaching agricultural lands it creates a perverse incentive for incorporating the countryside trying to modify norms and functions (López, 1981). As a side-effect of it, low-income families are relocated further away on cheaper areas at increasing distances to work places and social pressures on rural villages by the demographic increment. So, the 'urban limit' is not seen as an efficient planning tool because it discretionally transfers 'wealth' to particular owners and also does not control the expansion at all. However, and aside from critics, it still remains and used to incorporate new areas under regulations (Interview 13) (Figure10).



**Figure 10.** Historical growth of Santiago and the areas for expansion (yellow) defined by the 'urban limit' (Galetovic, 2006)

### The abolition of the 'urban limit'

Based on the aforementioned, some detractors of the 'urban limit' considered its abolition to correct distortions and to increase the amount of available land for urbanisation. Assuming that the 'land' is a scarce commodity, the 'urban limit' was abolished in 1979 (see Figure 9, map of 1979 in which the 'urban limit' coincides with the 'regional' limit). The idea was to increment the land offer and so, decrease land prices (Petermann, 2006; Gross, 1991; Sabatini, 2000; Pavez, 2011). However, landlords did not sell their lands and kept them empty to catch value according to the city's growth. So, the urban area entered into a fast land-price increment that creates rings of expensive lands nearby the city. So, closer lands became unaffordable for social housing and thus, poor families were located on remote areas and rural villages without transport infrastructure and services (Ducci, 1997; Rodriguez y Sugranyes, 2004; Hidalgo, 2007). Urban fringes became fragmented, shaped by poor neighbourhoods separated from workplaces and surrounded by rural space.

According to local planners, along with the abolition of the 'urban limit' the creation of 'expansion' areas became problematic as the understanding of the city as scenario of land speculation derived in a scattered concentration of poverty with implications on infrastructure provision and taxation performance. It is particularly serious in southern Santiago because in that period the large concentration of low-income families – originally from slums – triggered unforeseen socio-economic effects on communes historically linked to rural economies and with low rates of social insecurity and needs for services (Drake, 2003; Tapia, 2002).

As a solution, in 1994 a new plan (PRMS/94) complemented the concept of ‘expansion’ with ‘extension’ to avoid discontinuous growth and encroachment of rural outer villages, and reinstated the ‘urban limit’ to regulate new areas of contiguous growth. However, the concentration of poverty in southern communes advanced in the 90s and was reinforced by successive governments in order to apply social programs and benefits (Interview 24; Ducci and Gonzalez, 2006; Tapia, 2002; Sabatini and Salcedo, 2007).

### *Institutional asymmetries*

The encroachment of the nearby countryside is also determined by institutional asymmetries between the MINVU and other ministries in charge of outer lands and countryside regulations. In particular, the lack of barriers from the Ministry of Agriculture allows urbanisation on rural areas as ‘urbanisation’ is understood as a matter of ‘housing’ and thus, in charge of the MINVU that – as seen – does not have strong regulations on outer developments. Additionally, agricultural authorities are often in a political position in which rejections of urbanisation are unpopular for real estate firms – unless legal infringements – and above all because they have a very limited influence in defining the urban limit and other urban conditions on rural areas (Interview 13).

This asymmetric institutional context is being analysed considering impacts of urban sprawl in the southern area of Santiago, but also to improve inter-ministerial coordination. Indeed, some impacts on agricultural properties are considered as irreversible once urbanisation processes have been settled (ODEPA, 2012; SINIA, 2012; Guitierrez, 1985; Brignardello and Georgudis, 1997; Naranjo, 2009). However, inter-ministerial improvements in coordination for fringes urbanisations still depend on political agreements among coalitions, mutual flexibility and support (Interview 12).

### *The law n° 3.516/1980*

A specific regulation identified as one of the key factors that trigger unexpected expansions is the law N° 3.516/1980 that defines the so-called

'Parcelas de Agrado' [Pleasure Plots], which allows residential private urbanisations beyond the urban limit defined on 5000 m<sup>2</sup> sites. The idea is to preserve rural characteristics of the landscape although residential functions.

To urbanise a rural area invoking this law, developers should get a favourable report from the Ministry of Agriculture indicating that there are not negative impacts and that the land subdivisions are in accordance to plot's sizes to protect rural activities. However, it is well-known that a land under 10 hectares is not agriculturally competitive and thus, the regulation only protects the rural aesthetic but not its functions. As a result, it defines an area technically allowed for 'urbanisation' (with master plans, subdivisions, houses, swimming pools, pipes, sewage, backyards, gardens, garages, storages, energy supply and others) under an agricultural image that determines basic restrictions outside the urban area. In the same vein, as the land is de facto 'residential' the Ministry of Agriculture cannot exert extra regulations and thus, these areas are recognized as 'free restriction urban zones' in which finally the only restriction is tied to the plot size (Interview 12; Ministry of Agriculture, 1980; Borsdorf and Hidalgo, 2005; Hidalgo, et al., 2005).

This law also allows exceptions from the Ministerial Regional Secretary of Agriculture (SEREMI) who approve plots' subdivisions for less than 5000 m<sup>2</sup>. These exceptions should only be applied to build social houses as part of national priorities. So, the SEREMI of Agriculture requires a report from the MINVU – which always supports these initiatives as it commands these developments – to then deliver an approval for new urbanisations. Despite formalities, the process depends exclusively on the SEREMI of Agriculture and could be arbitrarily interpreted by every regional authority along the country, and on every presidential period. Thus, urban encroachments based on this law can differ region by region and also over time. This volatile political situation catches the attention of regional authorities regarding future political positions (Deputy or Senator) and thus, urbanisations are often approved as a way of gaining political support from different sectors.

At the end, urban/rural fringe areas are apparently regulated by this law but strongly dependent on political authorities (Interview 13; Interview 12).

This pattern of urban encroachments– residential urbanisations on half-hectare plots – has been rapidly spread over the metropolitan region and the country. Because of the land size, housing quality, private roads and long distances from the city, this model is mainly assumed by high-income families that live in sorts of large-scale gated communities, without public facilities and considered as segregated from the urban fabric (Interview 17). It is seen as a ‘pseudo-urbanisation’ identified by Naranjo (2009) as ‘the infiltrated city’ (Naranjo, 2009). In several cases, these peri-rural urbanisations have spanned small villages increasing fragmentation also on rural allotments (ODEPA, 2012; SINIA, 2012; Boccardo, 2011; Salazar, 2010). These half-hectare urbanisations have been critically analysed in regards of their socio-environmental impacts and as outcomes of a lack of coordination between different ministries and levels of governance (Guitierrez, 1985; Brignardello and Georgudis, 1997; Naranjo, 2009).

### *Conurbation zones*

Conurbation zones are mainly linked to transport infrastructure, particularly high-speed regional motorways. These areas are increasingly complex due to the unregulated coexistences of rural and urban functions.

On the one hand, several rural areas still keep animals and factories – such as pigs, horses, cows, milk factories and others – that increasingly disturb the coexistence with new residents who decided to live near clean and quiet environments (Ducci and Gonzalez, 2006; Naranjo, 2009). This is a common issue in southern conurbation zones – such as the area between Santiago and San Bernardo – in which many social conflicts are related to the dynamic of rural and industrial activities (noise, smells, truck presence and others) and urban lifestyles associated to clean air, quietness, green landscapes, security and others (Interview 26). Finally, and due to increasing social claims and environmental impacts, agricultural facilities use to be withdrawn and new residential urbanisations can take place (Interview 13).

On the other hand, in some specific zones the steadily unregulated encroachment of agricultural lands has led to extra impacts on the general environment such as those created by impervious surfaces as a result of extended suburbanisation. Along with the relocation of industrial facilities, it triggered superficial water streams that flood both local and also external lands and several high-quality agricultural lands lost fertility (Roubelat and Armijo, 2012). A particular case in point is an agricultural suburban area located in La Pintana commune well-known as ‘Huertos Obreros y Familiares’ [Workers and Familial Orchards] that lost natural irrigation capacities due to the urban expansion (Interview 40; Roubelat and Armijo, 2012; Catalán, Fernandez and Olea, 2013; Madaleno and Armijo, 2004; Gurovich, 2003). Other cases are the conurbations placed in the communes of San Bernardo and Maipú in which residential lands coexist with agricultural, industrial and commercial services and describe increasing environmental pollution.

These coexistences placed on conurbation zones illustrate several tensions between differing political doctrines, institutional frameworks and actor’s interests that make these cases relevant to analyse the implications of interstitial spaces in planning. So, the aforementioned cases – the Workers and Familial Orchards and conurbation zones – will be addressed by this research in chapter 7 to analyse their determinants, role and implications.

### ***Absence of regeneration policy***

The absence of a regeneration policy to recover internal underused spaces also contributes to the sprawling expansion of Santiago. Despite some efforts to promote internal densifications – such as the creation of the ‘Zonas de Renovación Urbana’ [Zones of Urban Renewal] or the so-called program ‘Quiero mi Barrio’ [I love my Neighbourhood]<sup>2</sup> – a standard regeneration policy for obsolete industrial facilities or infrastructural spaces is still experimental and partial (Sepúlveda, 2009; Programa ‘Quiero mi Barrio’, MINVU, 2007; Bertrand, Figueroa and Larrain, 1991). This situation

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<sup>2</sup> Programa ‘Quiero mi barrio’: the aim of this program is to contribute to the improvement of the quality of life of people who live in neighbourhoods with high degrees of urban deterioration, segregation and social vulnerability, through a participative process of recovering public spaces and families’ surroundings (MINVU, 2007).

applies to different spatial scales as many small derelict areas are also reclaimed to be integrated with constraints related to financial support, institutional coordination and citizens' participation (Sepúlveda and Larenas, 2010).

The absence of a regeneration policy relies on several constraints. One of them is related to the preservation of urban identities based on traditional architectonic and urban characteristics based on historical heritage or urban qualities. This is the case of those areas defined by two/three story houses in which a regeneration policy can trigger the construction of residential towers or commercial services. Another constraint pertains to the lack of financial support to recover brownfields – many of them with good connectivity and land capacity – and others underused lands (Interview 19).

The array of empty and small-scale undeveloped lands of Santiago is not minor. In 2012, a study of the Chilean Chamber of Construction (C.Ch.C.) detected several vacant plots over 2 hectares without restrictions to host 150 inhabitants/hectare. However, and although good locations, the focus for reconversions is still on central districts considering that from the 90s onwards statistics showed a steadily decreasing population rate and underused infrastructure. So, in 1992 a repopulation plan was launched supported by a special subsidy that stimulates housing constructions in the so-called 'Urban Renewal Zones' and based on attractive financial figures both for developers and buyers (Verdugo, 2003). However, this program was not strong enough for changing the expansive trend and to stimulate the location of social housing programs on inner lands. Arguably, the lack of interest for internal areas has been historically reinforced by people's preferences for living in suburbs, land prices and individual private properties irrespective of their size, neighbourhood quality and distances to workplaces (Interview 20; Interview 19; Sabatini and Salcedo, 2007; De Mattos, 1999; Echeñique, 2006).

### *Normative gaps*

An instrumental weakness in regulation that promotes Santiago's sprawl pertains to the diversity of 'normative gaps'. It is well-known that real estate

firms command their projects considering normative gaps to materialise larger developments beyond restrictions. In the case of social housing developments, for instance, a compulsory regulation compels developers to attach a transport impact study in projects over 250 car-parking lots (Ordenanza General de urbanismo y Construcciones, Estudio de Impacto sobre el Transporte Urbano, EISTU). So, they define several projects – each one for 249 parking lots – avoiding the aforementioned obligation. Over the years, a large residential area has been expanded based on several ‘249-car-parking lots projects’ with severe impacts on streets, functionality and public transport supply. Additionally, families tend to acquire cars over time and use narrow streets as parking areas increasing street’s saturation. Thus, these residential zones are saturated, their capacity to increase density become limited and so, new outer areas should be developed for providing more houses (Interview 25; Interview 53).

### *Political support for infrastructure*

Related to the aforementioned, transport infrastructure emerges as crucial to increase densities and so, avoid expansion on new outer lands. However, increments on density also impact on roads capacities as it supposes more circulation of private cars or/and public transport. So, it is known that although several suburban municipalities have land capacity to support new (or more) densifications, their infrastructure capacity cannot support proportional increments.

In part, this is due to weak local financial capacities, centralised budget restrictions or even political disparities between central and local authorities that leave changes in municipal land-capacity on stalemates. Assuming that reduced municipal budgets are mainly intended to public and green spaces maintenance, infrastructure investments (and improvements) should be provided by central authorities from different ministries – such as Public Works, Housing and others – and thus, local authorities should justify investments and municipal land changes via development projects to improve land capacity, increase densification and thus, avoid sprawl.

Nevertheless – and aside from technical assessments – a political dimension in this matter is again seen as crucial to determine projects' approvals or to become part of the agenda. Prioritisation of infrastructure investments greatly depends on political alignments and negotiation skills of local and central authorities. Literally, if a local Mayor is not politically aligned with central authorities – or does not belong to the same (or ideologically affine) political party – the assessment of an investment project can be delayed or simple rejected. In the worst of cases, the long-term agenda of road improvement can expire and thus, definitively lose its place in the investment list.

More concretely, road capacities in Chile are designed to support construction of 6 stories blocks – considering densities and potential car users. So, if road capacity is not changed it is not possible to increase density via higher towers, for instance. One special fact in this matter is that residential models of 6 story buildings do not require a lift (Ordenanza General de urbanismo y Construcciones, 2014) and so, top floors are only reached by stair. It directly affects the socio-economic profile of potential buyers: people who are able to buy a flat without lift, only using stairs. As high-income families prefer lifts, the residential model can only be targeted to middle or low-income families that would not be able to pay for a lift or any other extra service (swimming pools, gyms, private security, etc). It defines a market constraint that influences the rejection of private firms in developing an area, and confirms local authorities' decision to keep low-income targets renouncing to the expected social mobility and communal diversity (Interview 56). So, if there is not local/central political alignment, changes in suburban trends become problematic. As alternative, communal Mayors can stimulate smaller developments – according to current infrastructural capacities – but soon or later new pressures for social housing arrive along with the need to incorporate outer lands instead of increasing inner densities.

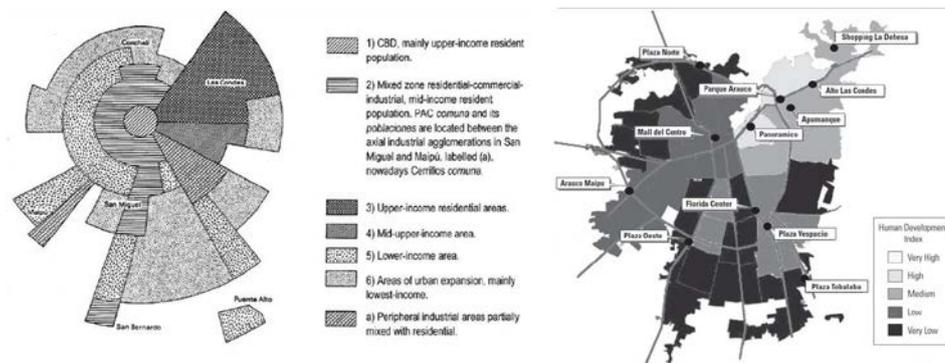
### ***Relocation of slums***

One long-standing determinant of Santiago's sprawl has been the relocation of slums in suburban communes. This process has been particularly focused

on southern communes clearly defined as receptors of low-income population. Eradication of slums from central areas has been a permanent policy from the 80s onwards, originally aimed to provide basic shelters and urbanisation for poor families. Later in the 90s, it was reinforced to concentrate beneficiaries of social programs. This policy is highly criticised by the concentration of poverty and the expansion of the city with increasing rates of residential segregation, territorial disparities, and lack of services and infrastructure.

In this light, the southern sprawl is clearly contrasted with Northern and Eastern areas in which upper class population is concentrated. This segregation defines a clear map of socio-economic profiles that confirms the high levels of socio-residential segregation of Santiago (Figure 11). Specifically, northern communes have increased consumption power attracting new investments, infrastructure and commercial services and conversely, southern communes are highly dependent of social programs and public benefits.

The impacts of the segregated suburban expansion of Santiago have been addressed via the application of social programs, but also via normative flexibility that allows the location of commercial services. In particular, one of the clear expressions of this flexibility is the appearance of metropolitan shopping centres conceived as sub-centres. This condition was indeed proposed by the PRMS of 1994 that determined the location of several suburban 'sub-centres' and a faster occupation of the southern area of Santiago driven by political pledges of social housing goals. In this context, the provision of houses was seen as a matter of infrastructural achievements and urban liveability – based on public spaces and connectivity – was left behind as secondary goals (Tapia, 2011).



**Figure 11.** At the left, a diagram of Santiago and different socio-economic groups (Bähr and Riesco, 1981 used in López, 2009). At the right, Santiago with shopping centres its correlation with the Human Development Index (Sabatini y Salcedo, 2007)

The idea during the 90s was to build more houses than the previous dictatorship period and thus, prove the efficiency of democracy (Hidalgo, 2007; Ducci, 1997; Rivera, 2012). However, it defined that urban sprawl would not be seen as a problem assuming that housing provision was part of fundamental needs for poor families irrespective of the land consumption (Interview 55). The feasibility of this operation relied on flexible norms and minimum standards, and the receptivity of southern suburban communes in receiving poor families. So, the communes of Puente Alto, La Florida, Macúl, Cerrillos, Maipú, Pudahuel, La Pintana, San Bernardo, San Miguel, La Cisterna, Lo Espejo and Pedro Aguirre Cerda, but also others peri-rural such as Melipilla, Lampa, Buin, Padre Hurtado and Calera de Tango, received the most of social housing operations of that period finally defining a pattern of disperse expansion characterised by the concentration of poverty (Salazar and Oettinger, 2014; Hidalgo, 2007; Tapia, 2011; Tapia, 2013).

As a result, the aforementioned communes were determined and extended by socially vulnerable population and a concentration of poverty that impacted on local residents that finally applied to relocation programs or simply emigrated to peri-rural villages. Some others simply ‘abandoned’ their houses or left them to relatives or friends. This phenomenon created ‘ghost’ communities of empty houses that were finally taken by marginalised groups that deteriorated neighbourhoods and social co-existences. In some cases, and due to the aggravation of social problems, the government authorised demolition of some areas – such as ‘Población El

Volcan' and 'Bajos de Mena' at La Pintana and Puente Alto communes – to then build new neighbourhoods in other locations. In this process, the commune of San Bernardo (an originally compact small rural village), for instance, was transformed into a sprawled and overcrowded environment of poverty due to the arrival of massive low-income population supported by relocation programs. Also and along with the socially homogeneous expansion, the massive re-location of slums increased demands for social services and security, and transformed the original urban landscaped depicted by small houses and open yards, into fenced properties provided by security alarms and private guards (Interview 32; Ducci, 1997; Rodriguez and Sugranyes, 2004; Gurovich, 1999; Rodríguez and Winchester, 2001; Hidalgo, 2007). There are also some cases in which communal administrations were insufficient in regard of increasing population and thus, were administratively split up in two smaller districts. Some communes were literally 'created' to receive population from slums (literally 'receptors communes') that also contributed to create large-scale contexts of social vulnerability defined by large and disperse extensions of housing developments (Interview 34; Haramoto, et al., 1997).

For some, the urban sprawl determined by relocation of slums is seen as an outcome of a neoliberal State in which the demand is subsidised, the housing provision is externalised and location is defined by an unregulated land market. In this context, the 80s period is seen as a 'builder' of poverty expressed by low-quality houses without services while the democratic period (the 90s) is seen as a 'concentrator' of poverty to justify application of social benefits (Interview 21; Interview 55).

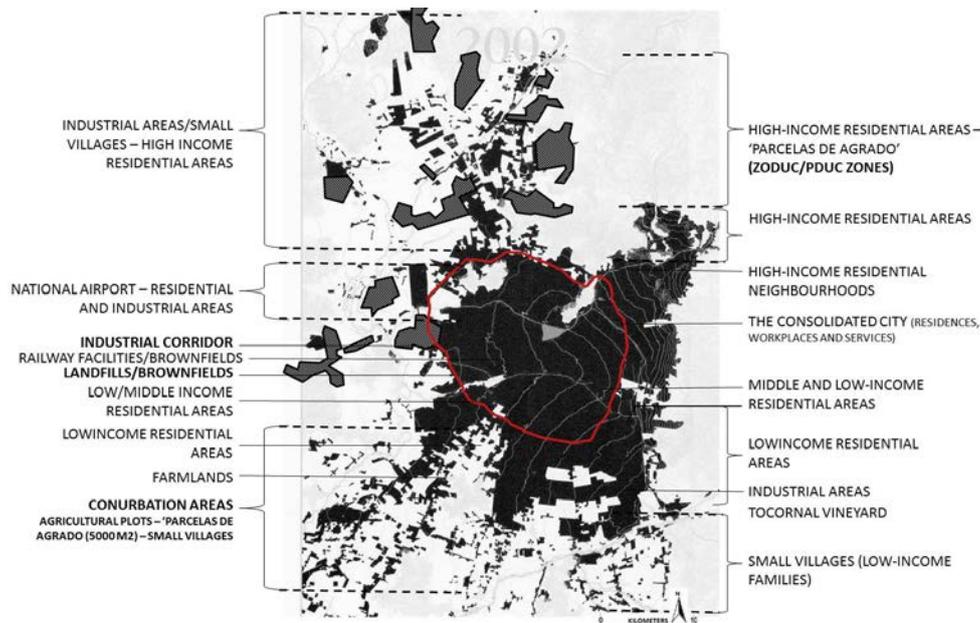
As part of the neoliberal rationality, these operations were strongly promoted by the manifesto of 'my own house' – only possible to be achieved in cheaper outer lands – that posited the values of becoming a landlord of a private property that would increase its value over time. For local planners, the 80s not only was the decade for massive housing provision but also for the increment of undesirable urban sprawl, urban disorder, lack of services and green spaces, poor connectivity and concentration of poverty. The poor characteristics of these peripheral areas

were driven by the ‘minimum standard’ as a paradigm of efficiency in the use of financial resources. Also, people relocated at southern suburban areas were eradicated from central ones – near schools and workplaces – to finally obtain a house but lose social opportunities and mobility. So, this population became highly dependent on public transport that – considering the average travel time to reach workplaces – that transformed them into ‘urban travellers’ (travel to schools, to health services and workplaces almost the whole day). This dependency also impacts on social behaviour as long distances to services and workplaces do not allow a balanced distribution of daily-life time (Interview 36).

For local planners, Santiago’s sprawl is highly determined by slums eradication and concentration of poverty that consolidated massive areas of ‘individuals who live to work and to pay bills’, with low salaries and without chance of spending time in recreational or social activities (Interview 36). All in all, this expansion is identified as unkind for families, children and elders who are literally trapped in distanced poor suburbs (Interview 30; Tapia, 2011; Rocha, 2005).

#### *Upper-class outer developments*

Upper class developments have also contributed to Santiago’s sprawl. Indeed, these residential areas reach outer rural districts traditionally understood as outside the city but recently included in new regulations and instruments from the PRMS/97 onwards. The location of these developments – mainly at northern rural communes – clearly contrasts with the preferred location of social housing areas – at southern communes – characterising Santiago’s sprawl as a functionally homogenous phenomenon but highly differentiated in socio-economic terms (see Figure 9). These northern developments have been recently included within metropolitan plans despite their physical disconnection to the city. This is the case of the Colina commune, for instance, that describes several ZODUC and PDUC zones to allow outer developments internalising impacts for traffic congestion, environmental pollution and encroachments of rural areas (Figure 12).



**Figure 12.** Santiago and the locations of ZODUC and PDUC zones. In red, the Américo Vespucio (AM) ring-road that marks the limit between the consolidated city and areas for expansion/extension (author's map based on Galetovic and Jordan, 2006)

This area – originally composed of agricultural allotments of low-income families – currently hosts most of the outer upper class developments clustered in gated communities well-served by private roads, security and green spaces, and stimulated by geographical attributes and proximity to workplaces located at the nearest communes of Lo Barnechea and Vitacura (Salazar, 2010; Hidalgo, et al., 2005). These schemes shape a regional scale of sprawl supported by political flexibility to allow privatisation of infrastructure, security, public spaces and facilities for local residents (Interview 53; MINVU, 1998; Contrucci, 2012; Trivelli, 2011; Borsdorf and Hidalgo, 2005; Cooper, 2010; Castro, 2005).

### *No taxation on empty lands*

The absence of taxation on vacant lands in Chile contributes to discontinuous urbanisations as landlords prefer to leave an inner suburban land empty as a way of catching value over time and thus, new developments should skip empty spaces to relocate new housing projects or services beyond consolidated areas.

This taxation flexibility is seen as a stimulus that finally can derive in the physical erosion of a land in terms environmental and physical properties.

So, undeveloped, derelict, abandoned, vacant, underused or even inner lands labelled as ‘rural’ become part of the normal suburban aesthetic and without obligation on maintenance, cleaning or security services. Indeed, the currently amount of undeveloped lands is seen as considerable and physically able to address problems derived by the fragmented expansion related to better location for services and others. However, these lands are mainly private and not compelled to internalise impact fees, neither transfer plus value to local municipalities. So, several vacant plots remain empty over time and cannot be used or acquired to supply housing demands or services (Interview 3; Cámara Chilena de la Construcción, C.Ch.C., 2012).

### *Undefined urban sprawl*

Although there is a vast body of literature that describes Santiago’s expansion as an instance of urban sprawl (De Mattos, 1999; Armijo, 2000; Borsdorf and Hidalgo, 2005; Link, 2008; Castro, 2005), there is no consensus to clearly establish more technically its different aspects, degrees of dispersion, density’s progression or other elements that allow the development of a common theoretical definition. This ambiguity includes definition of territorial units identified as matter of ‘sprawl’ and their boundaries beyond administrative criteria. Thus, the assumption of urban sprawl as a common pattern that explains the urban development has found a certain consensus, but nevertheless generalisation and lack of specificity abound and are complemented by terms such as fragmentation, dispersion, metropolisation, suburbanisation, expansion (Heinrichs, et al., 2009; Link, 2008; De Mattos, 1999; De Mattos, 2001; Ducci and Gonzalez, 2006). This generalisation impedes an understanding of urban sprawl and the means to improve planning tools to control it.

Considering these conceptual constraints, there are also instrumental difficulties to measure impacts of Santiago’s sprawl and so, to determine if detriments of metropolitan growth are directly related or not to this pattern of urban development. Apart from comparisons with more general cases on ‘urban sprawl’, socio-environmental implications seem to be the clearer and thus, Santiago’s sprawl is only seen as problematic in those terms or in

those areas in which environmental sustainability is negatively affected (Romero and Órdenes, 2004).

As seen, Santiago's sprawl is a process defined by multiple political, social and economic determinants. Although after the 90s planning instruments have dealt with impacts of uncontrolled fragmented expansion, Santiago's sprawl is nevertheless an ongoing and *de facto* situation determined by market predominance, the role of public policies and institutional constraints. It created an unbalanced landscape in terms of physical standards, socio-spatial distribution of services and population, but also political and negotiation capacities of suburban districts. On this inertia, Santiago's sprawl has reached peri-rural areas spanning outer communes, conurbation zones and small villages in which a series of unexpected impacts have taken place and several interstitial spaces become present as a clearer dimension of Santiago's sprawl.

So, the next section discloses the determinants of the interstitial spaces that compound the unbuilt suburban geography of Santiago. As those that configure Santiago's sprawl, the determinants of its interstitial spaces are closely related, in some cases even confirming that those that define sprawl itself are somehow simultaneously defining its unbuilt nature.

### 5.3 DETERMINANTS OF SANTIAGO'S INTERSTICES

Santiago's sprawl describes a series of interstitial spaces recognized by planners, policy-makers, developers, politicians, residents and the specialised literature as diverse, valuable and relevant to change suburban inertias driven by the predominance of the housing debate, minimum urbanisation standards and socio-residential segregation. These interstitial spaces describe a diverse unbuilt suburban geography depicted by different functional, morphological and geographical scales.

Several institutional actors are involved with different interests in, and understandings of what are, the interstices, their impacts and potentials. As such, they can be described – after Lefevbre – as contested spaces of an evolutionary process of economic production, historical and cultural

meanings with beyond their spatial characteristics (Brenner and Elden, 2009).

In this light and for the case of Santiago, the range of interstices that composes this interstitial territory is described by agricultural and industrial lands, brownfields, landfills, metropolitan public spaces and facilities, geographical restrictions, conurbation zones, former airports, military facilities, smaller scale farmlands and orchards, research centres, railways lines, infrastructural spaces, buffers of security and conurbation zones. Some of these spaces are currently well located nearby connectivity, energy supply, services and consumption power due to populated surroundings and thus, identified as relevant and possible to be prioritised by the urban agenda. These spaces also have land capacity for hosting more urbanisations – including social housing projects and services – or simply as elements of land speculation (Ducci, 2006).

As seen, while local and central authorities have sought to channel Santiago's growth and its overspill fully marked by socio-economic plans to relocated low-income families into selected locations in fringe/belt areas, planning decisions have finally been driven by contingencies and institutional misalignments that left several interstitial spaces as evidence of less controlled processes in planning. Their condition as 'interstices' emerge with the city's arrival but their origins as functional (or less functional) suburban spaces is varied and rely on different socio-political, economic, functional and physical factors driven by different institutional frameworks.

In this section, empirical evidence to understand 'why' interstitial spaces emerge in Santiago's sprawl is provided, and concretely what are the determinants that trigger their presence as components of the Santiago's unbuilt suburban geography. What is clear is the fact that although determinants of Santiago's sprawl and its interstitial spaces are strongly linked, while the suburban landscape is morphologically homogeneous and socio-geographically clustered, the unbuilt geography is composed by a diverse array of spaces, morphological patterns, distribution, factors of

origins and finally as a contested ground of interests that suggest a more comprehensive approach to disclose its implications.

### *Planning rationality and policies*

As seen in the previous section, the Chilean planning system relies on differing visions on urban growth but at any case determined by the role of planning policies in regulating individual initiatives mainly placed on outer lands. In this scenario, interstitial spaces are always seen as elements to be reclaimed and densified, or restricted to remain underused as they catch value over time. This potential densification is also related to some anti-growth narratives in which interstices emerge as alternatives for more compact environments – directly or indirectly assumed as more sustainable.

In a similar vein and regarding developing interstices, their condition as ‘internal’ gaps inevitably entails the implementation of regeneration policies – currently embryonic and supported by sort of experimental programs aimed to central areas and small scale interventions in low-income neighbourhoods – or mega developments that entails high levels of institutional coordination, alignments of central and local interests and stabilised long-term policies. At the same time, their interstitial nature is seen as negative due to their inefficient land use, demands of maintenance and risk of informal encroachments. All in all, it is clear that planning policies do not have a clear state to incorporate the interstitial spaces at the same level of the built-up space and so, arguably these absences appear as one of the determinants that define their presence.

### Interstices from ideological divergences

Developing Santiago’ interstices discloses ideological divergences related to the stimulus on market trends v/s consolidation of public benefits, even within political coalitions (Interview 15; Siavelis, 2008; Roberts, 1994; Fernández and Vera, 2102). So, reconversions of inner lands are argued as expensive, inefficient, or socially unaffordable for low-income population, and thus, sprawl must be stimulated. Conversely, compact environments are seen as also more efficient and environmentally sustainable and thus, reconversion of inner lands must be stimulated (Interview 1).

Additionally, and derived from the aforementioned, planning regulations – aimed to provide freedom of action to private initiatives – did not define strong controls on outer lands that consolidated a planning system fully adjusted to promote expansions rather than internal development. As part of this agenda, land liberalisation, abolition of urban limits, expansion on outer rural lands and absence of land taxations for inner undeveloped lands were defined as main instruments of urban growth, and encouraged the presence of different undeveloped suburban lands. This agenda is directly tied and constitutionally supported by the role of the State as ‘regulator’ and provider of the social demand to stimulate the creation of new housing areas for low-income families. Thus, regeneration of inner vacant lands, reconversion of derelict spaces, creation of new inner neighbourhoods, or infilling underused spaces are simply lagged behind logics of expansive growth and illustrate failed attempts in implementations of large-scale urban projects that materialises political ideals – such as the ‘compact city’ – into urban form (Interview 55).

Such divergences have been exemplified by some recently emblematic cases such as the mage-urban project called ‘Ciudad Parque Bicentenario’ (CPB) – placed on a former military airport – or the proposal for a new metropolitan Zoo placed in a currently declined research centre known as ‘La Platina’ inter alia. Some public authorities see this situation as a lack of political will and a tension between ‘fundamentalists’ actors – who do not want to promote the urban growth – and others extremely neoliberalised who only promote expansions (Interview 33).

#### Conceptual differences (urban v/s urbanised)

Conceptual differences to distinguish between an ‘urban’ or an ‘urbanised’ area also emerge as a factor that trigger the presence of interstices. However, in this case the definition of an ‘interstice’ not necessarily means ‘empty’, ‘disintegrated’ or ‘undeveloped’.

On the one hand and for developers, an area can appear as ‘developed’, ‘integrated’ or ‘urbanised’ but still describes an interstice in terms of land

capacity, densification or possibilities to achieve better standards. Thus, suburban interstitial spaces can also manifest as ‘built-up spaces’ but still understood as ‘gaps’ in the urban fabric in comparison to the rest of the area. On the other hand, a land could be formally labelled in plans as ‘urban’ although it is not necessarily ‘urbanised’ – physically and spatially speaking – and remains empty or without clear signs of physical densification (Interview 27). In fact, for developers there are no clear (or absolute) distinctions between ‘empty’, ‘undeveloped’, or ‘underused’ spaces as all could be deprived areas – irrespective of their degree of emptiness or densification – with clear needs of infrastructural improvements. In the same vein, an ‘undeveloped space’ could be a currently densified area but still underused, or those with plot capacities that can support more density. Cases in point are many low-density areas located near new railways extensions or roads improvements, for instance, or other lands well-served by roads.

These ‘under-densified’ or ‘underused’ lands are seen as a type of ‘interstitiality’ that opens questions related to the ‘degree of emptiness’ that defines the threshold of the ‘interstitial condition’, above all because conceptual boundaries between ‘empty’ and ‘underused’ become diffuse in terms of land capacity and socio-physical deterioration, or when the scale of analysis changes from urban to metropolitan or regional magnitudes. There are several examples that illustrate this type of interstitiality – such as the low-density residential areas defined by the law N° 3.516/1980 [Pleasure plots] currently embedded within the suburban landscape, or residential areas located near new railway services such as the south part of Matta Avenue, the whole area of Los Leones Avenue, Holanda Avenue and El Aguilucho Avenue inter alia (Interview 22; Interview 27). So, these suburban interstices – although ‘developed’ – emerge as a different category determined by the lack of densification on well-structured and served lands.

#### Plans and property atomization

Assuming the fact that many interstitial spaces of Santiago can become urbanised lands – actually included within regulator plans as ‘extension zones’ to host social housing projects – there are many others that would

remain in a stalemate due to their condition as shared areas of internal subdivision known as ‘property atomisation’ (Interview 27; Interview 41). This happens when a large-scale land is divided into many small properties to be indistinctively sold. It derives in a cluster of different landowners that by different reasons do not develop the land at the same time or show differing interests regarding their properties. It has happened in Santiago’s suburbs in which several strategic areas are a matter of successive subdivisions that converted lands into a group of small undeveloped private properties.

One of the consequences of these subdivisions is the fact that a cluster of small plots means a cluster of potentially differing interests, which simply makes impossible any initiative at metropolitan scales and thus, the lands – or part of them – remain interstitial. Indeed, it is known that almost the 80% of the Chilean population have become private owners due to strong promotion – during the 80s and 90s – of private property as a socially transversal commodity; similar socio-economic groups have acquired geographically proximate lands and properties creating large clusters of subdivided areas. This phenomenon in Chile has been historically supported by public subsidies and culturally accepted as ‘the dream of one’s own house’ – irrespective of plot sizes and locations – that created large fabrics of private properties everywhere. As a result, a scarcity of unified large plots and negotiation capacities among several private owners make almost impossible the reconversion of large-scale plots formed by several small-scale properties. Indeed, for many developers it is easier to make urban regeneration when the State is the owner of strategic lands rather than privately atomised clusters. Additionally, financial private operations on these clusters even have political repercussions because when a large-scale project should be developed, the buyer should convince all small landlords to sell their properties, which is intricate, unregulated in terms of price controls and seen for many as another scheme of undesirable gentrification (Interview 27). Thus and again, outer lands become ‘easy lands’ for developers considering plot sizes, regulations and landlords’ agreements (Interview 16; Interview 27).

### Outcomes of legal disputes

For practitioners, interstitial spaces are natural elements of cities – mainly defined by a tension between private and public lands – irrespective of its context or political regime. They appear as outcomes of property regimes in which increasing privatizations define successive landlords over time that can derive on disputed heritages, subdivisions, irregular sales and other legal issues. Also and from a similar legal perspective, land regulations and norms often derive in differing interpretations that make the city a scenario of legal disputes. As a result, several plots remain interstitial as there are litigations in progress and thus, in a stalemate for years. These situations are expressed in some (sub)urban areas of Santiago in which uncompleted buildings, abandoned and derelict lands, or temporary parking areas have taken place.

Considering that legal disputes are common issues of the urban context, empty or stagnant spaces become common elements of the city's landscape and finally assumed as common. So, these pending lands are legally restricted on issues of legal heritages, bank loans, property subdivision between relatives or different owners, stalled projects related to regulatory sanctions and others.

### Financial and planning restrictions

In some cases, interstitial spaces are elements of different mechanisms of economic speculations in Santiago. For example, it is possible to see empty areas only equipped with a supermarket as a symbolic territorial 'stamp' in zones supposedly planned to host a certain amount of population in coming years. While the increment of population is in progress, the land can appear as undeveloped or simply as empty for some years showing a gap in the urban fabric. This often happens when the surrounding land is in hands of the retail (or supermarket) firm that for different reasons started the construction of the shopping mall before the residential areas (Interview 9).

In other cases, local municipalities do not prefer to change the land-use of an area as they expect for services instead of more houses. So, they try to keep the land empty – as long as possible – until achieving political

alignments in services provision. This is the case of southern communes on Santiago such as La Pintana and San Bernardo that still have a stock of interstitial spaces but intended to be supplied with infrastructure, workplaces, industry or public facilities (Interview 37).

Other lands still have competitive agricultural properties – such as the Causiño Macul and Tocornal vineyards in the southern Santiago – and thus, landlords prefer keeping traditional activities instead of changing land uses. In other cases, these activities – although are not profitable at all – are part of familiar traditions and so, remain as part of cultural heritage or in the expectancy of familiar agreements of new businesses. At any case, if agricultural activities decrease, the land price can increase due to city's proximity and infrastructure that can be also another way of increasing value. Finally, there are geographical constraints that increase costs of infrastructure supply that make the area unaffordable for urbanisation (Interview 16).

The lack of financial stimulus and strict regulations also do not stimulate the reconversions of deteriorated areas with some degree of historical relevance. This is also the case of less-developed lands with some degree of urbanisation but with land capacity to support larger densities. In this vein, regulations and weaknesses in land taxation for historical heritage do not provide stimulus to simultaneously intervene the area protecting patrimonial elements and increase densities that allow more profitable schemes. This issue appears as controversial because on the one hand, some areas are well located but without legal support to increase densities and on the other hand, the set of formalities for changing norms – above all in areas of historical heritage – are perceived as unjustified bureaucracy with negative impacts on land and housing market (Interview 27; Interview 19; Sierra, 2006; Melo, 1996). To address the aforementioned issue, some programs emerged at the 90s to support the reconversion of deprived historical suburban spaces but nevertheless, they were still seen as partial, experimental or unstable over time (Interview 33; Zapata and Arias, 2008; Sepúlveda, et al., 2009; Sepúlveda and Larenas, 2011). Unregulated land progressions, undensified spaces, the absence of political and financial stimulus to recover historical

areas are finally socially perceived as inattentions and weaknesses of the current planning framework that trigger unnecessary interstitiality in the suburban landscape (Interview 47; Interview 48).

#### Natural elements of suburbia

For some practitioners, interstitial spaces in Santiago are part of the 'social inertia' assumed as natural 'facts' that coexist with people for years, even accepting their deteriorated conditions (Interview 23). In the case of La Pintana commune, for instance, deteriorated borders of some agricultural spaces have been long-standing situations that neighbours perceive as day-to-day landscapes. These borders between agricultural activities and the city have fallen into a functional 'limbo' – sometimes abandoned, sometimes informally used - without clear and permanent social interest, maintenance, spatial definition or even restrictions (Interview 36). Even for central planners and technicians, this situation evinces that interstitial spaces have not been part of urban agendas oriented to address detriments of empty spaces, and confirms the absences in planning policies to integrate them into the socio-functional suburban performance (Interview 05).

#### ***Absences in planning***

In a more general view, developers and policy-makers assert that Santiago's sprawl and its interstitial spaces rely almost solely on the imperfections of the planning system. Both – urban sprawl and its interstitial spaces – are seen as expressions of inefficiency, instrumental absences, uncertainty/ambiguity in governance, and technical weaknesses in planning assuming that the city should be a fabric and interstices should be developed spaces, filled by new densities or infrastructure or somehow integrated landscapes to the urban fabric (Interview 03). However, this negative connotation is contrasted by others who see the interstices as spaces for leisure or environmental benefits (Interview 49; Interview 12; Interview 55) and thus, they should not be filled at all. In any case, these spaces still appear as inert gaps and scenarios in which planning is not operating at all. As a result of these inefficiencies, conurbation zones, absence of instruments to recover inner spaces, boundary lands between municipalities, individual outer developments, and deterioration of suburban interstices,

budget limitations and socio-functional inertia appear as determinants placed in the core of the planning system and so, as outcomes of its intrinsic nature.

#### Conurbations and ambiguous lands

Some of the weaknesses in regulation that trigger the presence of interstitial spaces are the conurbation zones – increasingly included within the regional/metropolitan space – that join Santiago with southern and northern communal areas. In these zones, partial regulations from different institutional frameworks coexist and sometimes enter into tensions and political misalignments.

These zones are mainly defined by transport infrastructure and several *de facto* developments that describe pseudo-urbanised zones of built-up areas and small-scale interstitial spaces. These interstices – the conurbations – have regional impacts as they are usually outside urban limits and hosting agricultural, industrial and urban functions. This mix of functions defines several legal and administrative issues with economic and social implications. The rural area between Santiago and Padre Hurtado, for instance, is a recognised conurbation (Boccardo, 2011; Ducci and Gonzalez, 2006) in which the presence of agricultural machines and chemical products has been prohibited due to the arrival of residential surroundings. It undermines the agricultural production and at the same time it restrains densification. Indeed, from the Ministry of Agriculture these areas represent a ‘gap of governance’ as they are administratively outside the urban limit but nevertheless progressively urbanised (Interview 13; Jirón and Pazderka, 1999). The intensification of conurbations has been recognised by scholars as one of the main factors of Santiago’s growth, particularly those between the metropolitan area and the agricultural villages of Padre Hurtado and San Bernardo, and Maipú, Peñaflor y Talagante to the South and South-West (Becerril-Padua, 2000; Ducci, 2002; Ducci and Gonzalez, 2006). The ambiguous governance of these zones also reaches the management of large-scale agricultural plots that are outside the jurisprudence of the MINVU. A case in point is the so-called area of ‘La Platina’ in La Pintana commune, which is still labelled as ‘agricultural’ – intended to develop

agricultural research under jurisprudence of the Ministry of Agriculture – but totally embedded within the suburban landscape and thus, under jurisdiction of the MINVU. Simultaneously and because of urbanised surroundings, their functional performance has been diminished and very limited to promote agricultural progresses.

Other cases are the vineyards – also located in La Pintana commune – that still keep wine productions. Also the Campus Antumapu – that belongs to the Universidad de Chile – still works on academic activities related to agricultural research. Finally, another case that deserves closer attention is the area so-called ‘Huertos Obreros y Familiares’ [Workers and Familial Orchards] – also in La Pintana commune – created in the 40s to provide food for local and external residents and still placed in a cluster of low density half hectare residential allotments. All of the aforementioned areas currently keep agricultural functions but embedded within the suburban sprawl and thus, describe a series of ambiguities in governance, functionality and pressures to provide urban amenities and infrastructure. These conurbation lands are recognised as non-consensus zones, contested spaces, considering the coexistence of differing institutional interests (Interview 3).

#### Absence of stimulus

The inertia of the planning system for promoting expansions contributes to the lack of background in infilling or regeneration policies that finally left interstitial spaces in a stalemate, pending, or simply as empty lands. There is a general consensus that the Chilean planning system is not properly prepared for addressing inner lands and that regeneration policies have been usually failed, partials, delayed or directly improvised (Sepúlveda and Larenas, 2010; Sepúlveda, 2009; Bertrand, Figueroa and Larrain, 1991; Moris, 2008). So, the inertia of the expansion has not been balanced with planning tools for addressing inner lands – even considering the available stock of empty lands to supply housing and services demands. As previously mentioned, the Chilean Chamber of Construction (2012) detected the empty lands over 2 hectares able to host high densities, currently well located near transport infrastructure and energy supply. However, the lack

of standardised norms, professional capacities, political experience and financial stimulus do not attract their reconversions into more integrated spaces to the urban fabric and so, they become derelict and environmentally deteriorated (Interview 10; interview 17; interview 29).

For developers, interstitial spaces of Santiago are outcomes of a lack of vision regarding the real capacity of the city in increasing densities, and also a lack of inter-communal coordination in implementing standardised policies to reactivate them and transform them in sub-centres or spaces for services and others. This issue contributes to consolidate the monocentric metropolitan pattern of Santiago and the derelict stage of suburban interstices (Interview 22; López, 2005). For developers, this reactivation of suburban interstices does not necessarily mean high densification – traditionally based on residential 20-30 stories towers – but alternative solutions of 6-7 stories blocks as suitable skylines that harmonise with small scale surroundings and green spaces. Concurrently, if interstitial spaces are densified, it increases consumption power and consequently the presence of shops, services and other infrastructures (Interview 19).

#### Inter-communal boundaries

Looking at political factors, developers explain that interstitial spaces are also outcomes of a lack of cross-sector coordination at different levels – above all municipal interactions related to their boundary areas. At this level, shared boundaries among municipalities are not zones in which new urbanisation and services are concentrated and thus, they result on inorganic growth, politically dependant and without coordination with neighbouring regulations. After a while, these boundary areas become attractive for centralised projects – mainly infrastructural – to relocate motorways, railways services, power lines, industries or others that finally consolidate their conditions as interstices.

Reasons that explain this lack of interest on boundary areas is related to political disputes between communes. Local planners disclosed the fact that Mayors are not interested in developing communal boundaries as their investments can provide services – and thus, political credits – to

neighbouring authorities or non-local people that is seen as an ineffective political target. This is particularly critical in cases in which two different communes that share a boundary area describe explicit political misalignments. Thus, the promotion of outer developments again appears as a better solution for housing projects or services and so, boundary areas become interstitials (Interview 09; Interview 31).

Aside from this lack of inter-communal coordination, convoluted regulations and market orientations do not allow systemic environmental assessments of large-scale open areas – as communal boundaries describe – to preserve urban interstices as environmental assets at communal and metropolitan scales. Finally, governmental policies at central and local level are not linked each other and technicians are not properly engaged in planning policies beyond pressing issues of housing or transport (Interview 08). So, lack of coordination, political misalignments and bureaucracy appear as determinants that leave boundary areas as somehow forgotten spaces without functions but for heavy infrastructure that respond to centralised interests (Chuaqui and Valdivieso, 2004; Bresciani, 2010; Chellew, Escudero and Seelenberger, 1973).

#### Land fragmentation

The Chilean planning system is widely recognized as a framework that works on the assessment of individual projects, case by case (Interview 3). This dynamic defined a successive addition of outer urbanised fragments that finally shape the entire metropolitan area as an interconnected system of urban islands interspersed with interstitial spaces. These connections are usually placed on interstitial spaces manifested at different scales and with different relational character.

This dynamic was properly configured by the definition of planning policies as regulator of land market operations in which private developers would define individual projects later evaluated case by case (Ferrando, 2008; Sugranyes and Morales, 2012; Reyes, 1999; Santa María, 1973). In this context, suburban interstices appear as random and natural outcomes of urbanisations and depict the suburban fragmentation that drives the

discontinuous growth. This random inertia of interstitial spaces also often determines their decadence and thus, informal encroachments, abandonment and deterioration. As such, uses – such as car parking, sport pitch or even informal residential occupations – are being consolidated over time. Other interstitial spaces are outcomes of flagship projects that entered into functional obsolescence – originally intended for massive encounters such as musical gigs or sport matches – that after events become underused. These spaces also seem to be outside the planning system and define scenarios of informality that make their reintegration increasingly complex. After informal encroachments, suburban interstices become ‘difficult lands’ as they involved different degrees of social structures with different interests and requirements (Interview 28).

#### The *status quo*

Along with difficulties in recovering interstices in Santiago, in some cases increasing levels of functional obsolescence and spatial deterioration define some areas as critical and so, politically visible. At certain level, they precipitate rapid implementation of regeneration practices – although the lack of experience – along with community participation, or infilling projects that disturb the normal tradition and the political *status quo* adjusted to evaluate outer projects under traditional norms (Interview 46). While the functional structure of the planning system tries to move its expansive inertia, interstitial spaces emerge as disturbances that entail different directions, priorities and appearance of new actors and interests. Nevertheless, their marginalised condition – both their own characteristics and surroundings – and the absence of planning tools leave them again as interstices. So, these cases are seen as spaces determined by their unexpected level of deterioration that suddenly disturb the political practice in planning (Interview 22).

#### Budget limitations, long/short-term tensions

Santiago’s interstices are also determined by the lack of budget aimed to maintain empty spaces. These are the cases of private and public interstitial spaces that after a while stop maintenance and become derelict (Interview 10). Apart for this, one of the key factors that define this restriction is the

annual evaluation of expenses that define the base for the next year's expenditure. Specifically, the Chilean public investment system is based on an annual budget aimed to accomplish political and administrative goals before the four years' presidential period. If these empty spaces are not included into any project or reconversion their maintenance becomes difficult.

This issue included formal squares and parks that after certain periods appear as abandoned and less frequently used by residents. There are also larger agricultural sites – such as vineyards or research centres – that are not subject of investments in green space maintenance, security, rubbish removals, protection of surrounding facilities, streets and others. This issue is particularly ambiguous in large scale private properties surrounding by low-income neighbourhoods. Landlords argue that surrounding residents informally occupy the sites, throw rubbish and misuse the space for illegal activities, but the municipality argue that cleaning, security and other services cannot be provided as it is a private property. So, the land enters into an increasingly deteriorating condition with impacts in the general urban quality of the area.

So, annual evaluations for budget approvals – both private and public – are seen as contradictory symptoms of a short-term rationale as most of plans are simultaneously conceived for 20-30 years. The logic behind this annual financial conception is a policy implementation 'step by step' (or year by year) under assessments of successful partial achievements. In this context, long-term projects should be divided in annual goals possible to be yearly funded and subject to evaluations. Although it seems to be logical as it provides flexibility and adaptation, most of initiatives are driven by political goals that depend on authorities in place, and finally conditioned to respond to electoral targets. So, as there are no presidential periods beyond 4 years, investments beyond 5-10 years are unstable and thus, open space maintenance, reconversion of public parks or others enter into the 'case by case' dynamic and again, stimulate consolidation of more secured outer investments and construction of new built-up areas (Interview 14; Engel and Galetovic, 2014; Barton and Kopfmüller, 2012).

### Uncertain landscape elements

Some suburban interstices of Santiago are recognised as part of the historical landscape, from the origins of the commune, in particular those defined by agricultural practices and so, considered as normal. However, and at the same time, due to the urban expansion they are also seen as ambiguous spaces that can be transformed but that nevertheless remain in a stalemate (Interview 3).

As historical places, these areas are assumed by local residents and authorities as part of their socio-cultural identity, history and traditions strongly linked to agricultural and industrial activities. Notwithstanding, many of these areas have been incorporated into regulator plans to be densified, others left as exclusively 'rural' and so, as part of the suburban landscape. The change in the historical land use of an interstitial space depends on the sustainability of economic activities or pressures from housing demands. In the case of San Bernardo commune, for instance, there are many rural spaces currently intended to be urbanized as a result of new regulations. Also, conurbations with other small villages – such as Nos and Lo Herrera – are now part of San Bernardo commune and incorporated as new suburban empty space for future growth. In the meantime, these new empty spaces should be locally maintained and supplied with security. In the case of San Bernardo, there are several interstitial spaces between the consolidated communal zone and the rural villages of Nos and Lo Herrera. The aforementioned still feature a clear rural identity recognised by their inhabitants and precisely depicted by the rural character of their interstitial spaces (Interview 26; Catalán, Fernández and Olea, 2013).

Summing up, Santiago's interstitial spaces rely on a series of uncertainties defined by the expansion and a planning system structured by tensions between long and short terms goals. It defines their character as dynamic spaces in latent transition or as 'pending' lands considering that they can be transformed onto built-up spaces or consolidated as suburban interstices that show high degrees of planned emptiness. The absence of regeneration policies, unattended communal boundaries, difficulties to improve cross-

sector coordination at different levels, lack of maintenance, weak land taxation and cultural inertias finally contribute to the ambiguous nature of interstices and their stalemate over time.

### *Technical and instrumental constraints*

#### The urban limit

For some scholars and policy-makers, the set of technical instruments and regulations that structure the planning system defines the pattern of disperse and fragmented growth that trigger the presence of interstitial spaces. As previously discussed, one of these instruments is the so-called ‘urban limit’ that highly influences the fragmentation of peri-urban areas as it stimulates a leapfrogged pattern of growth in which several interstices are left in-between. The ‘urban limit’ defines affects land prices of included urban areas and thus, stimulates the construction on cheaper but still closer outer lands. So, rural plots become (sub)divided in empty portions inside the urban area and densified portions outside the ‘urban limit’. This fragmentation is also encouraged by developers as current regulations do not include any impact fee for incorporating rural areas to the city and for keeping empty spaces that simultaneously increase values due to closer urbanisations (Interview 28; Cáceres and Sabatini, 2002; Giraldo, 1997).

#### Restriction zones

‘Restriction zones’ also define the presence of suburban interstices in Santiago. More specifically the term ‘restriction’ is used to indicate an area with restricted accessibility. These are the cases of strategic facilities (such as military bases or others), ecological reservoirs and geographical handicaps considered as dangerous for permanent or temporary activities such as water-flooded or unstable soil slopes. These nomenclatures are also used to label some private areas considered under risk of informal occupations (Interview 53; Melo, 1996). However, there are some areas considered as ‘restricted’ but not really dangerous if physical barriers and contentions are implemented. These are the cases of several slopes in which physical containments are included into urbanisation and construction processes. In the case of Puente Alto commune, for example, most of restriction zones are slopes with a 20% of inclination that were considered

as inappropriate for urban developments. However, these label is currently under revision as the area is considered as difficult but not dangerous if urbanisations consider mitigations and security. Indeed, almost every property in this area has been sold and the regulator plan changed to regulate the development of these lands traditionally labelled as ‘restriction zones’ (Interview 32).

In this light, the condition of an area as ‘restriction’ has been largely discussed by construction firms arguing that if there is a technical improvement or if authorities support investments on basic facilities, or even if there are changes in land-uses, so these areas would be urbanised with better standards. So, many areas still remain undeveloped – under this figure as ‘restricted’ or labelled with ‘exclusive uses’ – and so prevent other urbanisations remaining as interstitial spaces (Interview 22). In fact, it is also recognised that any of the aforementioned changes suppose an inevitable delay of at least 6 years (or more) in average to change the regulator plan and its norms. So, ‘restricted’ interstitial spaces – although seen as arbitrary in many cases – will remain undeveloped and only possible to be reintegrated under more flexible schemes, infrastructural improvements and political efficiency in changing plans and norms (Interview 33).

#### Technical tools

Some urban areas – although densified – are nevertheless considered as interstitial spaces in comparison to surrounding densities and continuity patterns of urbanisation (Interview 27). In most of cases, this interstitiality is determined by normative restrictions and regulations that impede increments on density or the updating of urban patterns.

Technically speaking, Santiago’s densities can be directly controlled by planners using specific tools and infrastructural investments. The most common tools in this way are the so-called ‘constructability coefficient’ and the ‘the land-occupation coefficient’ that allow increasing density by determining the maximum of square meters possible to be built in a property and the maximum volume/capacity of edification. So, if there is an

underused (or a low-density) area, for instance, a change in the 'constructability coefficient' that increases land capacities makes the area economically more attractive for developers. Thereafter, real estate firms are encouraged to buy these properties – supposedly well located – in order to build more densified neighbourhoods for middle or high-income families. With this operation, land prices increase and become unaffordable for local residents, finally triggering gentrification. At the end, the social consequence is the displacement of original low-income families as they cannot afford new houses – although profits in selling original properties – and thus, should leave the area being probably relocated in still affordable city's edge lands (Interview 28). As these operations are not ideologically and socially accepted for some political sectors, local planners and Mayors tend to avoid changing the 'constructability coefficient' and these areas remain as low-density or underused (Interview 27).

These norms, although standard can change area by area, and are subject to municipal administrations. Nevertheless, what is clear is that the stability of technical norm and instruments can produce a stalemate in some areas that once immersed in surrounding transformation are manifested as built-up or slightly densified interstitial spaces (Interview 19; Galilea and Hurtado, 1998).

### *Interstitials as financial commodities*

Economically speaking, another factor that determines the presence of interstitial spaces is their financial performance as empty lands. As seen, empty or undeveloped spaces can be used as financial commodities considering their increment of value over time, above all with the arrival of services, infrastructure or the city itself (Vergara, 2014), and additionally because in Chile they are not subject of impact fees or any taxation for negative externalities or side-effects that their condition as undeveloped can cause. So, interstitial spaces can take a role as financial elements and can be used as commodities for different purposes.

This issue is perceived as natural in a clear neoliberal Nation-State as Chile is, and the land is one of the most valuable commodities at different levels.

However, and although the apparently automatic benefit of land speculation, these operations are different in poor areas as in these cases the acquisition of land for new projects of services, housing or infrastructure are immersed in areas in which consumption power is still low. As a result, interstitial spaces located in poor surroundings are only attractive for public investments and use to be acquired (or developed) by public organisms that keep them undeveloped, abandoned and finally derelict (Interview 03).

So, the impacts of keeping interstitial spaces undeveloped – both from private speculation and public deterioration – are nevertheless perceived as to be corrected. On the one hand, for central authorities the absence of impact fees on empty lands is understood as a perverse incentive to promote land speculation instead of urbanisation (Interview 29; Interview 21). On the other hand, for developers the absence of standard financial stimulus restrains the regeneration of undeveloped tracts. So, as the planning system mainly regulates private initiatives, the private sector decreases its costs prioritising new developments in rural-urban fringes (Interview 21; Interview 25; Interview 23). Indeed, the regulation allows changing the formal label of an inner area from ‘urban’ to ‘rural’ in case the property does not have any sign of edification. It has been the way for many developers to avoid extra-cost as rural spaces are also free of taxation (Interview 03).

Lack of land taxation on undeveloped lands and their use as financial commodities started under the dictatorship regime of Pinochet at the middle of the 70s. In this period, the taxation law was removed creating a strong stimulus for keeping lands empty. In López’s words:

‘Land plots are generally acquired in advance by developers seeking to fully capitalize the ground rent increased by the externalities generated by public investments or rezoning. In Santiago’s inner city, the number of properties awaiting redevelopment largely exceeds the number of properties actually developed. A report in 2006 counted a total of around 8,000 hectares of empty or underused lots within the urban parameter of the Greater Santiago (this is only 500 hectares less than the entire main URSA<sup>3</sup>) and a total of 1,000 hectares of abandoned or sub-utilized plots in the inner city area (Trivelli, 2006) that produce further devaluation in their surrounding areas. This phenomenon is possible in Chile because the law against land speculation was removed by the military

<sup>3</sup> URSA: Urban Renewal Subsidy Area (López, 2010)

dictatorship (1973-1990), and regulations to control these practices have been left extremely soft by the more recent democratic governments' (López, 2010: 156).

Currently, an impact fees policy is being discussed (Interview 3). However, there are still differing positions regarding the real effectiveness of a taxation policy. In this vein, buying strategic lands, defining long-term leasehold contracts or re-defining land investments to create value (returning investments) are seen as alternatives rather than relying only on capturing differential rent (Interview 21; Zegras, 2003; Der Krabben and Needham, 2008).

In any case, this issue affects all the undeveloped lands across the city and not only suburban interstices. However, again and as part of the economic deregulation and irrespective of their geographical distributions all open tracts tend to remain undeveloped and become unaffordable for social housing (Interview 24). A particular case in point in suburban areas is the site called 'La Platina' – at La Pintana commune – originally conceived as a rural area for agricultural research. However, this land is currently surrounded by large-scale low-income neighbourhoods and seen as well-connected and with sufficient land capacity. Indeed, the current research activity does not use the entire land, which is seen as a very inefficient use and concurrently expected to be urbanised in coming years (Interview 11). However, the current stalemate of the area is supposedly related to the land price – still unattractive – even irrespective of the social consequences of the related to their emptiness (Interview 51; Interview 52).

All in all, the imbalance between private profitability and social demands – as well as the understanding of the land as a private commodity driven by the market – determines the presence of interstitial spaces as matter of financial speculation.

### ***The large scale, uneven geographies and functions***

For central and local authorities, large scale geographical areas – such as hills, flood-lands and other natural elements – should be labelled as public venues or protected areas due to difficulties with them being urbanised. They are recognized as handicaps for physical transformations to become

available for development. These are the cases of the Chena Hill, San Cristobal Hill, Santa Lucia Hill, Cerro Blanco Hill, all recognised as natural landmarks of Santiago's peripheries (Jirón and Mansilla, 2013; Gutiérrez, 2014).

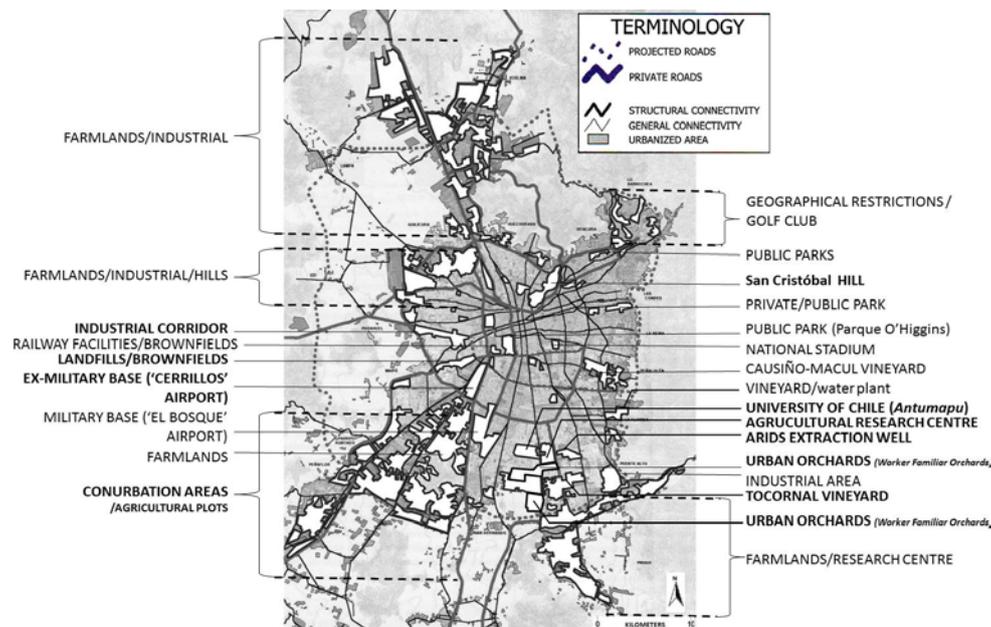
Functionally speaking, other lands are linked to functional obsolescence or lower levels of occupation. These are the cases of industrial, infrastructural, and agricultural lands labelled as 'green' or 'restriction areas' also somehow deteriorated and with restricted accessibility (Interview 04; De Mattos, 2001; Weiland, et al., 2011). These lands describe different degrees of 'emptiness' – in functional and physical terms – defined by their different levels of functionality (Interview 10). In Santiago, recognised examples are some parks, industrial and military facilities, the agricultural research centre 'La Platina', Campus Antumapu and 'Feria Lo Valledor' (the largest wholesaler fair of fruits and vegetables in Chile). Similarly, the Park Andre Jarlan at Lo Espejo commune – originally an extraction gravel pit – also shows similar patterns of interstitiality (Interview 34). Some others agricultural lands near consolidated areas still appear as profitable but the urban proximity restricts their functions. These lands are well provided of security, wasted removals and water due to their inclusion in municipal administrations. This is also the case of the agricultural plots known as 'Huertos Obreros y Familiares' [Workers and Familial Orchards] of La Pintana, increasingly changed to industrial uses (Interview 43; Gurovich, 2003).

Regarding infrastructural functions, several interstices defined by motorways, airports, research centres, railway services, industrial facilities and storages, farmlands, military bases, water treatment plants and others still host original activities but with decreased levels of efficiency and surrounded by residences. These areas are problematic as they cannot be expanded – falling into drabness and disrepair – and because their difficulties to be revamped due to heavy facilities and pollution (Olave, 1984). These infrastructural interstices use to be disconnected to the urban fabric as their buffers of security define large distances with the city. In other cases, they are labelled as incompatible and thus, as matter of

relocations (Interview 31; Del Piano, 2010; Eliash, 2006; Galilea, 2006; Trivelli, 2006; Valenzuela, 2010).

Specifically, the communes of Lo Espejo and Pedro Aguirre Cerda have inner railway lines and motorways that define large infrastructural spaces and also buffer of security. In the case of Pedro Aguirre Cerda (PAC), for instance, several interstices are part of the security space of the regional motorways ‘Autopista Central’ [Central Motorway] and ‘Autopista del Sol’ [The Sun Motorway] in the north, and Lo Ovalle Av. in the south. All of them are just placed on communal boundaries reinforcing their segregator character and at the same time their condition as boundary objects. As part of the social impacts of these interstices, residents who live closer to these infrastructures claim for tunnels or other physical barriers that provide more protection and connectivity, but security reasons – such as transport of chemical materials, for instance – and costs of interventions on these spaces are higher than any political program. So, infrastructural interstices remain as inaccessible and restricted (Interview 28; Interview 34).

Interstitial spaces of Santiago’s sprawl are clearly diverse and illustrate different origins, functions, characteristics, institutional frameworks involved and impacts. Although they share conditions as gaps of the suburban fabric – or elements out of norms and regulations – they nevertheless are non-standardised and specific, and emerge as triggered by different interlinked factors. Indeed, for policy-makers, scholars and practitioners almost every undeveloped land has its own determinants and potentials (Interview 54). In some way, these spaces are common elements of the suburban landscape but at the same time, they have specific characteristics that deserve specific analysis (Figure 13).



**Figure 13.** Santiago's map and its suburban interstitial spaces (author's map based on Echeñique, 2006)

#### 5.4 CONCLUSIONS

Santiago's urban sprawl describes both built-up lands and an unbuilt suburban geography defined by different interstitial spaces, interlinked in term of determinants and characterised by a permanent tension between somehow controlled and less controlled processes in planning.

As a context for the interstitiality, Santiago's sprawl is seen as triggered by different factors, nevertheless mostly as an outcome of a steadily emerging social housing policy defined by a neoliberal rationality in which unregulated market conditions contribute to the creation of suburbanisation and undeveloped lands. So, housing expansion, planning instruments, infrastructure investments, land market deregulations, partial normative controls, poverty concentration, central and local misalignments and absences in functional intensification explain both the suburban focus and the creation of interstitial spaces.

Regarding the presence of interstitial spaces in Santiago's suburbs, there is a wide consensus that they represent an inefficient management in metropolitan land-uses. The implicit perception of interstices suggests that they are understood as natural elements of the suburban landscape, empty, inert or undeveloped (or less developed), and assumed as anomalies that

should be amended. This negative connotation is linked to functional inefficiency, socio-environmental impacts and as difficult to revert due to the weaknesses of the planning system driven by private interests and lack of public coordination defined by the regulatory role of the State.

Drawing upon the literature of chapter 2 and 3 and the initial empirical findings of this thesis discussed in this chapter, the following chapter will scrutinise the perception, connotation and values of Santiago's interstices, and the understanding of their relevance from different institutional actors. Also, it will review their scalar condition and their relational character as elements that provide a framework to select specific cases to be thereafter deeply analysed.

## **6. THE DIFFERING UNDERSTANDINGS, SCALE AND RELATIONALITY OF SANTIAGO'S INTERSTITIAL SPACES**

### **6.1 INTRODUCTION**

Based on the empirical findings discussed in chapter 5, determinants of Santiago's sprawl and its interstices are closely tied to weaknesses and absences of planning policies. However, there is still no clear definition of what these spaces are considering their varied characteristics, scales and potential integration to the suburban fabric. What is clear is the fact that different actors offer different understandings that reflect different values and meanings depending on their impacts and benefits on surroundings. So, the definition of Santiago's interstitiality is neither fixed nor unique. However, all of them share their condition as 'in-between' or 'out of the norm' elements, ambiguous lands reclaimed to be reintegrated, nevertheless seen as 'interstices'.

In this chapter these different perceptions, definitions, meanings and connotations from different institutional actors are disclosed, along with their impacts and values for the suburban performance and planning. Also, this chapter addresses the factors that make them more or less relevant, and so, their place in the urban agenda. Finally, Santiago's interstices are defined by the geographical scale in which they are manifested and their relational character in terms of possibilities to host more or less levels of integration.

### **6.2 UNDERSTANDING SANTIAGO'S INTERSTICES**

Interstitial spaces of Santiago's sprawl are understood in multiple ways. Although they can be seen as standard elements of the unbuilt suburban geography, the view on suburban interstices relies on different political, legal, functional and spatial characteristics, but also professional and cultural biases that define them as varied, multidimensional and somehow undetermined. These differences also influence their relevance and condition as key elements that can trigger important suburban transformations.

So, this section provides evidence on the different perceptions and meanings of interstitial spaces from different institutional actors, and allows asserting that although interstices are widespread elements of the unbuilt suburban geography, they are nevertheless specific and ambiguous, and thus, deserve a deeper debate to make them visible for suburban agendas.

### **6.2.1 Definitions and meanings of Santiago's interstices**

#### ***Wasted and 'out of the market' lands***

For policy makers and from an economic perspective, interstitial spaces are seen as areas 'out of the market' (Interview 03). So, their condition as empty, derelict, inert or simply undeveloped pertains to the lack of financial tools to integrate them to the urban fabric and planning regulations. It is also reinforced by the literature (Rodriguez and Winchester; Hidalgo, 2007) that classifies lands that cannot participate of the land market and so, become 'wasted' lands. Coincidentally, politicians and central authorities see these interstices as 'wasted lands' considering their impacts transforming the suburban landscape at different scales (Interview 33).

The perception of interstices as elements that do not contribute to market dynamics is also derived from their land capacity. Many interstitial spaces that can host workplaces, public amenities, recreational facilities, increase densities and improve housing standards but without development are seen as wasted and as evidence of economic stagnation. Interstitiality not only refers to large 'empty' lands but also areas of economic obsolescence such as industrial spaces or undensified residential areas. The aforementioned are the most 'invisible' interstices as they appear as densified but nevertheless 'underused'. In this light, currently built-up spaces can also define a category of interstitiality based on its underused land capacity. These lands can also be subject to revamping policies although there is no framework, references and political background to address the reconversion of inner lands. In addition, institutional databases are still uncertain – above all in relation to property regimes, land sizes and infrastructure– and sensible to influences on information management (Interview 2).

*Interstices as borderlands*

Spatially speaking, interstitial spaces in Santiago are also seen as spatial disruptions of the urban fabric, specifically as internal borders between different urbanised areas. They are identified by practitioners and policy-makers as ‘urban moles’, ‘urban barriers’ or simply as ‘borders’ that make the city less efficient and more segregated (Interview 04). These ‘barriers’ are expressed by empty lands, heavy infrastructures and industrial facilities disintegrated from their surroundings (Interview 16)(Figure 14).



**Figure 14.**An infrastructural interstice between Cerrillos and Pedro Aguirre Cerda. This is a boundary area composed by a high-speed motorway, a railway line, derelict spaces, a canal and electric lines (author’s photo. May 2014)

In the commune of Pedro Aguirre Cerda (PAC), for instance, several infrastructural interstices are just placed on its administrative boundaries – determined by regional motorways and buffers – that separate the commune from the rest of the metropolitan fabric. They emerge as physical divisions and restricted areas and although they represent metropolitan and regional advantages, they are perceived as negative because do not deliver continuous connections, pedestrian accessibility and benefits of near developments. A case in point is the mega-urban project known as ‘Ciudad Parque Bicentenario’ (CPB) [Bicentenary City Park] – located at the neighbouring commune of Cerrillos – that includes a metropolitan park, but

due to the presence of these regional infrastructures – Departamental Avenue, Carlos Baldovinos motorway and the Autopista Central– the commune has 4km of no connection. It means that they are physically adjacent but spatially and functionally delinked (Interview 34).

Interstitial spaces as borderlands also signify closed spaces – such as military facilities or rural lands with restricted access – that are somehow trapped within the urban fabric and without possibilities to be expanded or connected (Interview 12). In this light, it is possible to infer that interstitial spaces as boundaries describe diminished relationalities at local scales and thus, a functional dependency that rests on regional/metropolitan inputs rather than local (Interview 13). These interstitial spaces are also recognised as somehow depressed, with clear signs of functional obsolescence and tense coexistences with surroundings (Interview 19).

### ***Reservoirs and opportunities***

For local planners, developers and scholars, interstitial spaces appear as ‘opportunities’ to improve urban standards at different levels. Specifically, southern interstices represent an opportunity to change suburban trends driven by low-density neighbourhoods and low-income families, and thus, diversify socially homogeneous environments (Interview 22; Interview 21).

Similarly, they are also conceived as ‘reservoirs’ of space to improve living conditions based on better standards, workplaces and services. However, as suburban interstices and fringe/belt areas outside regulations their possible functions are again determined by housing demands (Rivera, 2012; Bosier, 2004; Steinberg, 2002). This are the cases of La Pintana or San Bernardo commune, for instance, included in the metropolitan plan (PRMS100) where the plan included geographical restrictions – such as the Chena hill– and industrial areas but rather than services they are ‘reservoir’ for future housing developments (Interview 26).

### ***Functional obsolescence***

For developers and planner, interstitial spaces are expressions of ‘functional obsolescence’. In some cases, it means ‘empty’ but in other refers to slightly

densified lands – such as former industrial facilities or neighbourhoods – that entered into obsolescence. These areas are recognised element of discontinuity and functional disrepair. This condition is exacerbated by the absence of regeneration policies that does not allow reconversions or implementation of alternative uses (Interview 23; Interview 56).

In a more socio-functional perspective, interstitial spaces can increase density, above all in depressed neighbourhoods in which social networks improve living conditions and because their obsolescence contribute to the general environmental deterioration. This is the case of Lo Espejo commune, for instance, that has historical neighbourhoods with strong restrictions for increasing density that enter into continuous economic depression near interstitial areas (Interview 28). It influences their demographic composition as there are no attractors for new population, or local population leave the area as they cannot locally build new houses. In this context, interstices are alternatives for densification but also – considering their emptiness – evidence of socio-economic and functional stagnation (Interview 54).

### *Uncertainty and contradiction*

Although potentials, interstitial spaces are also perceived as uncertain scenarios for future developments, above all in socially depressed peripheral areas in which priorities are driven by demands on services and infrastructure. So, initiatives related to public venues, green spaces, services, security or housing developments well-provided of community spaces are not considered as structurally related to employment growth and functional efficiency and thus, remain undeveloped (Interview 53).

In addition, abandoned interstices can be informally occupied (Interview 47). In these cases, social encounters are driven by marginal groups or in other cases, massive celebrations such as musical gigs, sport or activities related to significant celebrations (Interview 49). This is the case of ‘La Platina’ site, for instance – that belongs to the Ministry of Agriculture – intended to develop agricultural research but currently underused and thus, perceived as an abandoned space that can host marginal activities (Figure

15). The area is also used as a park, a sporting pitch or as informal playground for children. This is an uncertain place because on the one hand, it is seen as positive for hosting recreational activities but on the other hand, it is also negative due to its marginality:

‘From here, it is possible to see the beautiful Andes Mountains. Also, on the 18<sup>th</sup> of September people come here to raise kites (...), so, it could be perfectly a park, you see? Do you think that if people appreciate how beautiful this place is they would throw out rubbish? (...) we would like to keep this open, with sport pitches, playgrounds, etc. It is so beautiful to see the mountains from here. That should be ideal for families and youth’ (Interview 49).



**Figure 15.** La Platina site at La Pintana. At the back there are the Andes Mountains. In the middle, there is the area for recreation. At the front, it is possible to see an informal shelter and landfill (author’s photo, June 2014)

Aside from their potential as social venues, residents who live near these interstices describe them as ‘potreros’ [paddocks]. In Chile, it is a pejorative term for areas without value, sense of belonging and abandoned. As ‘potrero’, it is a place for anything and everything at the same time. So, these spaces are also ‘free spaces’, not properly ‘urban’ but also restricted and dangerous.

This stigma responds to the socio-economic profile of surroundings as residents perceive that in wealthy areas local authorities and neighbours do not allow their marginalisation and informal occupation. However, in

depressed areas it is assumed that people who live in social risk can tolerate deteriorated conditions of the urban space (Interview 50). In addition, poor residents assume that they cannot claim for security, cleaning or others as they are receiving public 'benefits'. Thus, interstitial spaces remain in a double condition as informal venues– with somehow positive connotations – but also marginalised spaces seen as negative for security and improvements of living conditions (Interview 47).

### *Healthy spaces*

For scholars and consultants on issues of environmental sustainability, interstitial spaces of Santiago are 'healthy spaces'. This definition emerges as a vision of empty areas as part of the necessary green infrastructure that ameliorates impacts of pollution and support the survival of natural landscapes. In this category, agricultural areas have a key role as they not only provide green spaces, clean air and quiet environments but also workplaces that reinforce local economies. These spaces are particularly located at La Pintana commune, recognised as the most fertile area in the whole metropolitan region (ODEPA, 2012; SINIA, 2012). These rural interstices are still functional elements, nevertheless tensioned by planning aimed to use them to address housing demands. These are the cases of La Platina site (Ministry of Agriculture), Campus Antumapu (Universidad de Chile), Tocornal and Concha y Toro vineyard, and the 'Huertos Obreros y Familiares' [Workers and Familial Orchards], all recognised as 'foodscapes' by NGOs, FAO and social organisations (Interview 45). These areas are also seen as expressions of 'urban agriculture' and cultural heritage related to historical practices in social housing (Catalán, Fernandez and Olea, 2013; Roubelat and Armijo, 2012; Madaleno and Armijo, 2004; Gurovich, 2003; Ravetz and Loibl, 2011).

### *Spaces of isolation*

In a similar vein but more related to the values of the natural landscape, policy makers related to environmental issues see suburban interstices as places to be alone, isolated from the city but within the city (Interview 46). As suburban, these interstices are privileged areas nearby services and transport and offer calm atmospheres for stress relief, social encounters, and

possibilities to get in touch with nature. These spaces are to be ‘disconnected’, strategically unlinked but nevertheless within the city (Interview 14). Apart from isolation, these interstices offer ‘life-experiences’ such as practicing sports, games and alternative leisure. However, it is also recognised that these interstices deserve people’s empowerment, participation and institutional support to become proper ‘places’ provided with security and maintenance (Interview 36).

In the case of Campus Antumapu (Universidad de Chile) at La Pintana commune, for example, the area is defined by planners as an ‘urban opening’ that allows perceiving the landscape and also the city (at the back) that deliver a feeling of isolation but with a clear sense location and orientation (Interview 18). In the case of La Platina– also in La Pintana commune – the space is literally described by residents as a piece of countryside within the city that allows the experience of ‘rurality’. Surrounding neighbourhoods also obtain beautiful views of the mountains that according to local residents can easily be compared with traditional ‘postcards’. Referring to La Platina site, for instance, local residents describe the place as a unique atmosphere:

‘I love the countryside! and this evokes the countryside. If you walk to that direction, you can see the mountains. This is not common to see from other areas of Santiago. You can perceive the Andes much better. Indeed, yesterday was snowing and all children were playing in the place. We can see them playing until the last border, on the other side of the site’ (Interview 50) (see Figure 15).

As seen, Santiago’s interstices are perceived and defined in different ways. Nevertheless, they still host an ambiguous connotation as negative/positive determined by their environmental properties but also their marginal conditions. In this vein, the revision of their impacts appear as relevant for a better understanding of their nature and place in the suburban transformation.

### **6.2.2 Impacts of Santiago’s interstitial spaces**

Santiago’s suburban interstices are a critical issue as the city is assumed as a continuous entity that should prevent the presence of undeveloped lands and open tracts without functions or integration with the urban fabric (Interview

03). So, interstices are originally seen as undesired economic, social, physical, infrastructural, political and environmental by-products of Santiago's sprawl, elements of disconnection, isolation, fragmentation or marginalisation. However, their impacts can be also positive in terms of openness, public spaces, environmental services and green infrastructure, and refer to different urban dimensions such as social, economic, environmental and political. Interstices can also influence different scales of suburban transformations at local, metropolitan and regional levels and connect different levels of coordination between different institutional actors.

### ***Market distortions***

For planners, lack of development on Santiago's interstices affects the land market as they increasingly raise values as a result of urbanisations without development and extra costs for landlords, operating as a direct transference of wealth (Interview 3). That is why undeveloped interstices are matter of speculation that create market distortions for the acquisition of available lands for public services and well located social housing projects. This distortion varied for those inner lands well-served by roads, for example, used to be more expensive in comparison to others located outside the city. Additionally, undeveloped interstices are not liable for tax payments and can be even labelled as 'rural' and thus, avoid obligations related to security or provision of basic urbanisation such as water, cleaning or maintenance (Interview 03).

### ***Socio-spatial segregation***

In the case of private lands, undeveloped interstices are physical 'barriers' that separate neighbourhoods and stimulate informal occupations increasing levels of socio-spatial segregation (Interview 06). Despite this, planners argue that marginalization of interstices is strongly linked to surroundings, quality of environment, uses and others. These elements affect the potential reconversion of interstices as they become specific. All in all, marginal interstices contribute to the debate on regeneration and infilling policies, and the elements that increase their relationality (Interview 10; Interview 54).

***Socio-cultural disruptions***

A cultural impact of suburban interstices is related to the arrival of the city and the differing coexistences between residential and rural functions. People who live in rural pockets have a strong commitment with their rural history, activities, social relationships and agricultural businesses. Many of these rural lands are part of familiar heritages supported by generations. However, with the arrival of the city several social conflicts arise related to their agricultural or urban profitability, land renting or selling. These issues can be a matter of familiar divisions, crisis of identity and that can even derive on legal disputes. This is particularly common in southern communes of Santiago – mostly defined by rural lands – in which rural interstices still keep agricultural traditions and are tensioned by the arrival of urban functions and their potentials (Interview 12).

***Services provision***

For developers, the impacts of interstitial spaces are systemic and multi-scalar, and narrowly linked to the provision of services, assuming that they can provide services at local, metropolitan or even regional scales. In this vein, intervention on interstices can trigger major suburban transformations—although their current condition as marginalised spaces has an opposite effect again stimulated by land market speculation and thus, unaffordable for services (Interview 19). This marginalisation increases the poor condition of some areas, reinforcing them as ‘pockets of poverty’ (Meza, 1996; Ducci, 1997; Rodríguez and Sugranyes, 2004). This is a serious issue because in poor contexts there is a lack of consumption power and so, a lack of interest from private institutions to provide services (Interview 22).

***Stimulus of informality***

For local planners, the main impact of interstitial spaces pertains to their condition as ‘unoccupied lands’. This condition suggests an inefficient land-use that also implies costs in providing security and maintenance. It is seen as a cultural pattern of the Chilean context in which public spaces, open areas, empty or underused spaces are synonym of ‘no man’s land’ and so, not clear to be maintained. This connotation is closely related to negative stigmas such as fear, lack of community engagement, absence of social

rights and insecurity (Dammert, 2004; Salcedo, 2002; León Balza, 1998). After a certain degree of deterioration, maintenance becomes increasingly expensive and even fences and other security systems are infringed. With informal occupations, the risk of encroachment becomes higher and can achieve the form of slums. Once a slum is consolidated, eradication becomes politically complex. As a way of solution, in some cases 'eradication' is replaced by 'radication' programs, aimed to keep inhabitants and reinforce their social networks (De Ramón, 1990; Kusnetzoff, 1987; Gurivich, 1999). However, these actions are very controversial in Chile because on the one hand, some argue that the right of private property should be guaranteed by the State and so, informal occupants should be evicted – even when the land is intended to remain empty. On the other hand, long-standing empty lands are seen as 'unnecessary properties' that should be acquired by the State to supply social demands (Richard, 2014; Schlack, 2007). Despite controversies, eradication is legal and landlords are not compelled to develop the land (Interview 28).

These interstices reinforce a sub-culture of informality understood as 'valid' as people assume the encroachments of unoccupied lands as a legitimation of rights, and as counter-reaction against marginalisation (Interview 18). So, informal settlements, landfills, parking areas and others are all consequences of long-standing unoccupied interstices that derive in the perception of absence of owner and rights vindications (Interview 46; Interview 40).

### ***Pollution and social insecurity***

Residents link the condition of abandoned interstices with negative impacts related to environmental degradation. Noise, dust, heavy traffic, broken and dirty streets, lack of security and long periods of inactivity are also characteristics of some suburban interstices. Unmaintained spaces also contribute to the arrival of wild animals and plagues such as rats, wild dogs, carrion birds, dead animals, and also bad smells, the absence of grass maintenance, stagnant water, rotten materials and others that depict a daily-life suburban landscape that finally confirm their condition as 'marginal' and polluted (Interview 49). Additionally, the absence of electricity during the night contributes to insecurity, crime and shelter from police, drugs

traffic, prostitution and others. This situation triggers ‘extra jobs’ for residents that organise to provide their own security, clean the area or to prevent the presence of wild animals (Interview 52).

Residents who live beside La Platina site, for instance, perceive this space as abandoned, and as an environmentally damaged land:

‘This site is directly linked to drugs and crime. Also youths go there to get drugs and then during the night they walk around doing bad things. There is also prostitution to that side. Bad guys escape to that way and then it is difficult to find them as there is no light, nothing. They are hidden among the scrubs. Also, there is a canal with stagnant water’ ... ‘I am a policeman and I cannot see anything positive on this place, above all because before the area was full of crops, flowers and trees...and now? It’s just a slob place for rotten stuff. You also can find stolen cars’ ... ‘all vacant lands are the same condition and provoke the same. You can see this at La Florida...it is the same. And also people don’t have a proper behaviour and use these spaces for illegal things’ (Interview 49).

### ***Reconciliation and local identity***

As contrast to the aforementioned negative connotations, developers at MINVU indicate that interstitial spaces have positive impacts in separating incompatible functions such as heavy industries and residences. These spaces reconcile functions and ameliorate impacts.

Furthermore, some suburban interstices are ‘reservoir’ for improving planning practices and thus, to address pending issues related to services provision and social housing (Interview 16). In this vein, local planners see interstices as positive reservoir for the consolidation of historical neighbourhoods and to support their own demographic growth. So, new space for relatives, for instance, emerges as part of the community improvements through suburban interstices. The main aim is to promote densification giving the chance to young people to remain in the area closer to their parents (Interview 28).

Finally, the natural landscape is seen as positive, above all when the area supports agricultural activities and ‘foodscapes’. These interstices are useful to promote local food, medicine and educational goals. In terms of administration, they suggest a reinforcement of local organization and a strong sense of identity based on local jobs and shared activities among

residents. So, rural interstices impact positively in the sense of community, traditions, environmental improvements, local economies and community engagement (Interview 45).

As seen, the impacts of Santiago's interstices are mainly related to economic distortions, environmental degradation and social deprivation. However, they can also impact on future land uses and landscape improvements that can influence planning agendas.

### **6.2.3 Values and potentials of Santiago's interstices**

Santiago's interstices have a series of interlinked values and potentials based on their characteristics, distribution, functionality and scale that can improve the suburban landscape and planning policies. Their current values suggest that their potential incorporation as active elements of Santiago's sprawl can trigger a series of transformations and improvements, and reinforce the continuity of suburban areas using their attributes – scale and relational character – as elements that intensify suburban functionality. In this light, it is also disclosed that Santiago's interstices can play a key role in changing trends mainly driven by the residential debate.

#### ***Changing trends***

For local authorities, politicians and developers, suburban interstices are opportunity to improve standards, services and infrastructure of new and existing areas via the creation of public and green spaces combined with new residential typologies for diverse socio-economic groups (Interview 15). In a similar vein, another value of interstitial spaces is their spatial diversity that can provide specific features to suburban areas – currently recognised as homogenous – as they define different 'patterns of emptiness' that can also stimulate urban design and landscape management despite their condition as 'barriers, that can be also useful to distribute public amenities in different forms (Interview 18). Although their reconversions are still led by 'urban design' biases, interstitial spaces are still placed in the residential debate and thus, can open a more political view for their integration (Interview 22). In this vein, southern Santiago is seen as attractive as it provides a large stock of interstices with suitable properties

for agricultural activities and nature as factors of innovation and environmental improvement (Interview 24).

*Available land stock*

One of the values of suburban interstices is their condition as available lands. However, not all undeveloped spaces are in hand of public institutions and thus, they cannot be considered as part of the available stock for public interests. This situation is currently leading the creation of a ‘bank of lands’ as reservoir for future growth (Interview 21). This shortage of public lands is seen as an outcome of an increasing land privatisation started in the 80s by the State that for some represents one the major contradictions of ‘pro-public’ political narratives. On the one hand, the political discourse tends to rely on ideological axioms related to public benefits based on the importance of the land tenancy, but on the other hand, regulations and norms promote land privatisation at different levels. Some commentators argue that this apparently contradictory position is determined by legal restrictions tied by constitutional norms in which the right of ‘private property’ was consigned as a supreme element of individual and social progress. So, Santiago and its interstices finally describe a privatised landscape in which most of interstices belong to private owners (Interview 20). In this light, interest to develop built-up areas emerges stronger than leaving them for public benefits. Additionally, suburban development is supported by public subsidies in housing that encourage landlords to densify lands assuming that the buying capacities are provided and by public benefits (Interview 21).

Aside from this, there is nevertheless a lack of accurate data to determine the range of available properties able to provide public benefits. Additionally, available lands belong to different public institutions that suggest a more complex level of coordination, negotiation and administrative improvements (Interview 29). In particular, these improvements must be focus on restructuring the institutional performance of key dependencies such as the MINVU and its Service of Housing and Urbanisation (SERVIU), the Ministry of Public Works (MOP), Transport

and others, and their budgets to allow the acquisition of interstitial spaces (Interview 27).

### *Innovation in social housing*

A recognised value of some of Santiago's interstices pertains to their potential to improve social housing models, which currently consists in a land of 120m<sup>2</sup> plus a 36m<sup>2</sup> house that considers future extensions. This scheme is known as the 'casa con patio' [House with Yard] and is a seminal unit conceived as a private property composed by a portion of land and a house. This model has been repeated in peripheral Santiago for the last 30 years consolidating a homogeneous mono-functional landscape.

New narratives of suburban development are considering the functional diversification of Santiago's periphery via the provision of diverse social housing models (intended to different users such as elderly people, for instance, or young families), public services and infrastructure precisely located on interstitial spaces. It would include a diversification of predominant architectonic typologies (blocks instead of detached houses or communal/shared properties, for instance) and the inclusion of social variables such as community engagement and social networks:

'I believe in plans for interstitial spaces that worked well some years ago. For instance, 'the construction of your own site'...based on large sites with gardens, orchards, etc. intended to host your family and your descendants – your son, cousins, siblings, etc. You can build for everyone within the site with a proper plan to ensure privacy, accessibility and quality. This is much better than a small site in which when the son grows up, then he should go 40km away because he cannot afford to a near property. It even sometimes breaks the familiar economy. Our current models of social housing promote a false sense of sustainability based on a particular and strong sense of private property. Chileans say that the property could be small, ugly and distant but 'it is mine'. So, then they should get on the bus, take children to school, etc. and the dream is over. Many of us believe that this model should be changed, and also because of its environmental impacts. In this vein, I believe that if the policy includes elderly, for instance, there is an opportunity to change the trend. We could create a model based on 'provisional houses' (while people are alive) and then the houses should be passed to others (there is no private heritage). After an elderly pass away, the house returns to the Ministry and host another couple. These houses could be well located, with green spaces and services and could diversify traditional suburban environments' (Interview 20).

In a similar vein, low-income communes see interstitial spaces as an opportunity to create participative programs in social housing. In the case of

La Pintana commune, for instance, interstitial spaces become attractive for the ‘Comités de Allegados’<sup>4</sup> that look for lands to redistribute families in social housing projects. These families can be linked to others in a similar condition and then apply to a social housing program in the form of a ‘committee’. This figure provides stronger support to applications despite property regimes and is seen as another way to rebalance socio-territorial disparities, create more socially sustainable environments and provide fiscal stability (Interview 02; Interview 36).

### *Green infrastructure*

Aside from the housing debate, affordable green spaces are seen as another need of Santiago’s suburbia. Several studies describe the scarcity of green spaces and the unbalanced distribution among suburban municipalities, above all in southern communes clearly below standards (Reyes and Figueroa, 2010; Escobar, 2006). For planners and developers, this disparity suggests that interstitial spaces can contribute to decrease this imbalance and so, decrease the rate of urban inequality (Interview 27). Specifically, and in terms of green infrastructure, interstitial spaces embrace different expressions of ‘wildscapes’ (Jorgensen and Keenan, 2012), public venues and ecological spaces (Interview 55), and have implications beyond local surroundings considering their influence in the general metropolitan climate and regulations of temperature and humidity:

‘Natural and undeveloped areas have a strong environmental contribution. In the case of La Platina, for instance, this place helps to decrease the temperature of the metropolitan region along with the rest of agricultural lands as they provoke evapotranspiration. So, when the average temperature in Puente Alto is 4°C, here (in La Pintana) is only 0°C. This is a noticeable difference. Also, underground water streams are often obtaining superficial water from the city, i.e. through these open tracts. In this light, it is one of the key communes that support the natural city’s drainage. Summing up, the area is environmentally important due to its natural condition’ (Interview 37).

### *Public space and nature*

For scholars, policy makers and social organizations, the scarcity of public spaces in southern communes is a crucial issue that can be addressed

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<sup>4</sup> ‘Comité de allegados’ [Committee of Attached people] is a term to nominate the social organisations in charge of finding a home for families that have not been awarded with a subsidy and thus, are living as ‘guests’ in the house of relatives or friends during the waiting period. So, an ‘allegado’ [attached] is a member of an ‘attached’ family and is also socially identified as an ‘attached’ (see the report ‘Documento de trabajo N3, Centro de Investigación Social, Un Techo para Chile, Nov. 2009)

through the incorporation of interstitial spaces. It is seen that interstices can become an interconnected net of public venues, aimed to integrate the spectrum of derelict and undeveloped lands to the city, but also different urbanised areas and neighbourhoods. It also implies a modernisation of planning tools to include the intangible and hedonic value of undeveloped lands and open tracts (Interview 07; Quiroga, 2005). This valorisation also impacts on the taxation system as it embraces criteria of environmental and socio-cultural benefits. In terms of landscape, for instance, suburban interstices include uneven physical geographies composed by hills, valleys and even cliffs that add spatial complexity to the city, and urban activities related to leisure, education, sport and appreciation of nature:

‘Rural spaces within the city have enormous educational impacts. You can take a kid there to see a spider, animals and birds, or simply to enjoy the wild nature or to reinforce his/her social relationships. Unfortunately, internal rural spaces (as almost everything) are seen as “commodities” and when they are not productive they start to be depressed. So, their intangible values are still not included in the economic equation’ (Interview 12).

Reinforcing the value of these lands as natural spaces, residents and members of social organisations argue that:

‘Open spaces and natural soil should be maintained, even when they are not agriculturally productive. The unique experience of seeing the trees is a value itself. There is a difference between ‘value’ and ‘price’ and natural spaces worth because of their values. These spaces have history and could be a valuable heritage for future generations’ (Interview 40).

In larger scales, interstitial spaces can host activities such as camping, swimming, diverse types of sports, city farms and others, typically found ‘outside’ the urban area. Benefits of these spaces can be educational, cultural, social, health benefits and economic. Suburban families, for instance, that cannot afford to activities outside the city could use the interstices as alternatives for leisure and recreation (Interview 14).

Also, these spaces have educational benefits as they provide contact with nature and agricultural activities. The cases of La Platina and Campus Antumapu at La Pintana commune, for instance, describe a strong a ‘provincial atmosphere’. These are landscapes in which it is possible to see the Andes Mountains, the trees, the sun, but also the silhouette of buildings

that evoke the feeling of being close to the city (Interview 46). As residents recognise:

‘From this space, La Platina, it is possible to see the nature, the mountains, and the grass. It is also possible to see how seasons change. It seems to be within the countryside. Some days ago it was snowing and that was beautiful’ (Interview 48).

These landscapes are understood as complements to the city and social housing models in which the provision of private yards is restricted. In this regard, these spaces also supply demands of open space at urban and housing scales.

‘La Platina is a piece of countryside within the fully urbanized area...and that is a good element to create a diverse environment in which open spaces offer views and a break in the routine, the homogeneity. This space can be a park, which is not only a public space for the area but also for the whole Santiago. These areas should remain as open as there is a lack of green and public spaces. Indeed, our homes are quite small and in my case, for instance, I used the small open yard to build a roof for the car in the front garden! It was the end of my own little open space and for everyone in the area is the same, so, these spaces such as La Platina are the best chance to supply the lack of green open spaces for everyone’ (Interview 50).

Finally, it is also noted that these spaces add value to surroundings and influence decision-making in choosing a residential area to live. These values are related to the presence of nature that provides particularities to the area and suggest continuous maintenance:

‘When we arrived here (10 years ago) the place (La Platina) was fenced. So, we received the house from the government with a beautiful landscape in front...a place covered by plants, vegetables and flowers. Actually, the most amazing were the marigold flowers that made the landscape so beautiful. So, these places increase the beauty of their surroundings. It was one of the reasons why we agreed to come here. The most important value in a city like Santiago is when a place is well maintained and its natural landscapes are protected. It is a huge place in which you can find the openness, the open space’ (Interview 52).

### ***Rurality in the city***

Another value of suburban interstices pertains to their conditions as rural landscapes. The presence of rurality and human activities related to food production, animal husbandry and others is recognised as valuable for urban dwellers. It provides synergic coexistences as urban inhabitants can afford to rural knowledge and experiences in different ways, and farmers can afford to urban services and culture maintaining their rural lifestyles. So, residents, NGOs, environmental and social organizations, scholars,

practitioners, planners and local authorities tend to see these spaces as highly relevant to diversify the landscape and to provide cultural, historical, educational, environmental, spatial and scientific experiences (Interview 45). Some of these areas are identified as examples of ‘urban agriculture’ as they still provide seasonal food and are administrated by original families and descendants (Interview 44).

Classifying the rurality provided by Santiago’s interstices, they describe at least four categories: 1) those that still keep agricultural functions such as the vineyards or the Huertos Familiares y Obreros [Workers and Familial Orchards] at la Pintana Commune, 2) those that only keep few rural activities such as La Platina Research Centre and Campus Antumapu at la Pintana commune, 3) those lands formally labelled as ‘agricultural’ in the PRMS100but intended to real estate developments and 4) those with residential functions but with rural characteristics determined by the law N°3.516/1980 labelled as ‘Parcelas de Agrado’ (Allotments of Pleasure).

Furthermore, these lands can become ‘foodscapes’ (Sobal and Wansink, 2007; Cummins and Macintyre, 2002; Morgan, 2009) linked to the urbanised context. As green spaces they attract new suburban population and as rural, they can become examples of ‘agro-parks’ in which different types of vegetation can growth – including medicinal – and different types of city-farms can be developed. In this vein, rural interstices appear as alternative public realms that can also open new forms of community and institutional participation (Interview 45).

More specifically, the case of the ‘Workers and Familial Orchards’ at la Pintana commune describes a series of rural allotments linked to the housing provision and the production of local food. It was originally conceived as a rural area but became ‘interstitial’ due to suburbanisation. These lands were surrounded by social housing developments that defined a large-scale concentration of poverty (Interview 43). These spaces appear as rural in metropolitan and local plans but still depend on agricultural activities and preserve original characteristics from their creation in the 30s (Interview 41). This case is identified as transversally relevant for different institutional

actors and seen as one that can define major implications in planning. Thus, this will be deeply analysed in coming chapters.

Summing up, Santiago's interstices can speak to the housing debate but also to the reinforcement of the public realm. Their values rely not only on their current characteristics but also their potentials for changing trends and finally improving planning policies and instruments to incorporate them to suburban transformations. However, not all of them are perceived as equally relevant and thus, as elements that deserve an equal position in the urban agenda. In this vein, the next section discloses those suburban interstices recognised as relevant by different institutional actors from different angles.

### 6.3 RELEVANT INTERSTITIAL SPACES

Although the general relevance of Santiago's interstices is associated to their values and potentials, not all of them are equally recognised by their influence in planning and transformation of the suburban landscape. As seen, this relevance is determined by a combination of detriments, potentials and geographical scale. In terms of detriments, they are mainly identified as socio-environmental and related to current functions of interstices in which abandoned and industrial lands emerge as critical. In terms of potentials, land capacity, location and surroundings appear as important factors for large-scale interventions. In particular, those interstices immersed in areas with large concentration of poverty and different levels of marginalisation appear as important for political goals and housing supply (Rodríguez and Winchester, 2001). In this vein, the southern area of Santiago is the most relevant context considering the aforementioned factors.

In this section, several identified 'relevant' interstices are presented according to different actors, in a range that include public, private and social-based institutional representation.

#### *For policy-makers, politicians and planners*

##### Cerrillos airport – La Platina – Campus Antumapu

For policy-makers, planners and politicians, suburban interstices that can host major intervention with metropolitan impacts are the cases of the

Cerrillos airport site (Ministry of Defense and MINVU) at Cerrillos commune, La Platina site (Ministry of agriculture) at La Pintana commune, Campus Antumapu (Universidad de Chile) at La Pintana commune. There are also some brownfields at Maipú commune and San Bernardo, and conurbation areas to the south in which several industrial and residential developments are placed.

In particular, a highly prioritised interstice is the Cerrillos airport site as it has suitable land capacity, good location and is surrounded by low-income population (Interview 25). Indeed, the airport site has an on-going mega-urban project called ‘Ciudad Parque Bicentenario’ (CPB) [Bicentenary City Park] recognised as the first attempt of a large-scale urban regeneration to reconvert the area into a multifunctional sub-centre with residences, public spaces and high-quality infrastructure. This place was originally managed by the Chilean Air Force and worked as a military base for several years. In this case, military functions determined a set of restrictions for the suburban landscape mainly related to pollution, restricted access and lack of integration with surroundings (Interview 07).

These cases – Cerrillos airport site, La Platina and Campus Antumapu – have been selected in this research to be analysed in regard of their scale impacts and implications in planning policies in the next chapter.

### *For developers and consultants*

#### Less densified areas

Developers argue that relevant interstitial spaces are those located near transport infrastructure with good land capacity to increase density. This understanding does not distinguish between totally empty (or undeveloped) lands or those that actually shows different degrees of development.

In this vein, the presence of motorways – and particularly underground services such as METRO lines– defines favourable conditions to (re)develop new areas. This is possible to find in currently densified residential areas but intended to be improved by infrastructure. So, for developers the condition of ‘empty’ is not a factor that determines the

interstitiality of a land but rather those coined on regulations and plans that do not allow functional intensification (Interview 27). Considering these criteria, underused areas near Matta Avenue, Los Leones Avenue, Holanda road and the zone known as ‘El Aguilucho’ – all in Providencia commune – can be considered as relevant. Additionally, La Aguada Park, the Mapocho River and its borders, some parks such as Renato Poblete, Parque de los Reyes and Maipo River are also suitable considering their natural landscape, and the spectrum of rivers, canals and their green spaces also appear as opportunities (Interview 22). Nevertheless, the aforementioned areas are not transversally seen as relevant for other actors and thus, they are not considered in this research as selected interstices to be analysed.

### *Conurbation industrial zones*

Other interstitial areas identified by developers as relevant are the range of conurbations that drive the consolidation of the zones between San Bernardo and Lo Herrera, and Maipo and Padre Hurtado. These are southern communes that currently describe a rapid growth influenced by regional roads that connect these areas with outer towns and villages. These areas are also recognised by planners and other actors as crucial considering the rate of growth, the socio-spatial configuration and the still unregulated space in which several large-scale residential and industrial projects are taking place. So, these conurbation zones have been also selected in this research to be inspected in their scale impacts and relational character to connect different suburban areas.

Finally, developers also recognised the importance of industrial spaces due to their environmental impacts that diminish the quality of surroundings and thus, the competitiveness of some areas that are currently well-provided with services, consumption power and transport infrastructure.

### *For social-based actors*

#### Cerrillos airport – La Platina – Campus Antumapu

From a local perspective, municipal planners and residents prioritise interstitial areas regarding local needs. This is based on a critical view on centralised policies that are focused on housing demands that postpone local

agendas (Interview 24; Interview 36). Nevertheless, and aside from differences, there is a coincidence between local and central actors regarding what are the most relevant interstices that should be included into planning but not for the same purposes. On the one hand, while central planners see suburban interstices for social housing developments, local planners aim to use them for providing services such as educational infrastructure, security and others. On the other hand, residents see these spaces as opportunities to rebalance the currently unfair distribution of green and public spaces (Interview 43). Aside from these differences, the consensus is on the Cerrillos airport, La Platina and Campus Antumapu sites that, apart from their land capacities, they respond to historical factors that reinforce a sense of local identity (Interview 37; Interview 55). Socio-environmental organizations also coincide in identifying the Cerrillos Airport site, La Platina and Campus Antumapu at La Pintana commune as relevant, as they can environmentally contribute beyond local boundaries (Interview 45).

Apart from the aforementioned, others key interstices appear as relevant in regard of their potentials as ‘foodscapes’ – such as the vineyards, local orchards and empty rural spaces – although their locations at fringe/belt areas near the Maipo River or the peri-rural communes of Buin and Padre Hurtado (Interview 46; Interview 54).

### ***Rural and industrial lands***

Local actors also see that rural suburban lands are optimal as they do not have major physical restrictions and are currently well-located. They suppose lower costs in infrastructure and links to historical functions that match with rural socio-environmental needs. In this light, there is a wide array of rural interstices located in the southern communes of Maipú, Padre Hurtado, San Bernardo, Puente Alto and La Florida (Interview 26). In a similar vein, industrial lands located at La Florida, the military base El Bosque (at El Bosque commune) and some buffers of security are also recognised as relevant due to their location, land capacity and potential impacts on surroundings (Interview 35; Interview 56).

All the interstices identified as relevant share a good land capacity, location and are immersed in surroundings that are highly visible in the political agenda for applying social programs and benefits. Some of these areas are indeed a matter of ongoing proposal to be integrated to the suburban transformation.

#### **6.4 REGIONAL AND METROPOLITAN INTERSTICES**

As previously argued in chapter 3, interstitial spaces can be manifested at different scales – the metropolitan and regional being the most relevant in order to inspect urban sprawl.

In the case of Santiago, suburban interstices placed on these scales are determined by their land capacity, size, location, potentials and impacts, but also by their administrative condition as they are tied to more than one institutional framework. This administrative interdependency is properly seen in Chile as the main aspect to define the metropolitan character of an urban area. It can be defined by central/local dependencies, or different administrations at municipal levels (Aylwin, 1991; De Mattos, et al., 2014; De Mattos, 1999). Indeed, Santiago itself is defined as a metropolitan area named as ‘Greater Santiago’ as it is formed by 36 municipalities, each one with its own Mayor, plans and regulations. These scales – metropolitan and regional – are seen as relevant for implementing planning policies because metropolitan/regional actions suppose a chain of interconnected impacts that systematically influence several aspects of the urban development and the achievement of strategic social, economic and political goals.

##### **6.4.1 Metropolitan interstices and interventions**

The systemic condition of the metropolitan scale is reflected by those interstices that connect the different layers of the metropolitan administration or that spatially touch several municipal boundaries. It somehow coincides with those areas that allow the implementation of large-scale projects that can not only address municipal needs but also metropolitan and even regional. On these spaces, the nature of their interventions makes their scale explicit and reflects their importance in optimising resources achieving maximum benefits. So, one indicator of the

scale impacts of suburban interstices is related to their different interventions and their benefits, which place them on the top of the urban agenda (Interview 15).

In a similar vein, these interstitial spaces coincide with those identified by institutional actors as relevant – that apart from their multi-layer administrative character – host physical and spatial conditions to impact beyond local/municipal boundaries. In this vein, it is clear that metropolitan and regional impacts are key criteria to select and define the transformations of Santiago's interstices. These interstices have drawn the attention of institutional authorities, both for their negative impacts as underused lands and potentials for new developments. In terms of impacts, there is a transversal agreement regarding intervening these interstices. However, in terms of concrete actions there are differing positions and non-standard policies (Interview 33).

It is also clear that a stable regeneration policy is needed to address the metropolitan interstitial scale. Currently, regeneration practices are based on embryonic experiences on renewal programs to recover population of the city's centre (Bertrand, et al., 1991) and public spaces in deprived neighbourhoods (Sepúlveda and Larenas, 2010; Sepúlveda, 2009; MINVU, 2015, Programa 'Quiero mi Barrio'). However, the recovering of large-scale areas has been based on a 'project-oriented' rationale – rather than political – and thus, subject of professional biases (especially from architecture and urban design) and successive political clashes and technical gridlocks. This has been the case of the Cerrillos airport site and the CPB project at the Cerrillos commune, for example, or the proposal for a metropolitan Zoo placed in La Platina site at La Pintana commune that clearly illustrates the complexities of the metropolitan scale. These cases will be deeply analysed in next chapter, along with others that also scrutinise the relational character of such interstices of Santiago's sprawl.

### *The Cerrillos airport site and the CPB project*

The Cerrillos airport site is a military facility characterised by the presence of heavy infrastructure and multiple institutions that includes several

ministries, municipalities, private developers and political actors. Elements such as landing platforms and hangars, and strict restrictions that even embrace the aerial space and the approaching cone make the area complex to be revamped and subject of several political controversies. Its intervention has been part of the public debate since its announcement in 2001, taking part of several administrations, technical teams and adaptations of original proposals (Del Piano, 2010; Eliash, 2006; Galilea, 2006). According to planning authorities in the MINVU, the project-based rationale behind the intervention was not suitable to achieve ambitious purposes – that included high urban standards and a series of environmental and socio-political goals – and has been continuously modified to respond to housing demands and tensions between developers and public authorities (Interview 03; Interview 05; Interview 15; Trivelli, 2006). This site is a clear case of metropolitan interstitiality and illustrates the series of political perils that this scale supposes.

#### *La Platina site and the metropolitan zoo*

Another case of metropolitan interstitiality is ‘La Platina’ site – currently working as a ‘research centre’ – located at La Pintana commune. This is a 300-hectares site under administration of the National Institute of Agricultural Research (INIA), Ministry of Agriculture. It was created in the 60s in a peripheral rural space but is currently surrounded by low-income residential neighbourhoods. This area still hosts research activities but according to the administration, only 60/80 hectares are efficiently used. So, the site has been subject of interventions– such as parks or public facilities – although the most relevant proposal was the master plan to create a new metropolitan zoo in 2002. This proposal was an agreement between central and local authorities but nevertheless it never prospered due to a series of political, social and financial issues. Thus, central authorities developed a new master plan for residential areas and a metropolitan park (Interview 11; Interview 03).

#### *Campus Antumapu and its master plans*

Another metropolitan interstitial space is the ‘Campus Antumapu’, also located at La Pintana commune. It belongs to the Universidad de Chile (a

public university) and embraces a 300-hectares land used for educational purposes related to agriculture and veterinary sciences. The area is slightly densified by few buildings, so it appears as virtually empty. Considering its non-intensive use, authorities aim to change the land-use to sell and rent some land portions. Nevertheless, municipal authorities also have interests in developing social housing projects. This interstice was also intended for a metropolitan stadium and commercial services. Aside from differences, the land is still 'public' and so, a matter of several administrative constraints to be redeveloped. As a way of solution, university planners defined a master plan to foresee new land-uses that include a central park, areas for private vineyards, shops and social housing developments for different socio-economic profiles (Interview 18; Interview 46).

### *Gravel pits and public parks*

Several underused industrial lands of Santiago are defined by a series of gravel pits used to obtain raw material for the construction industry. Elements such as fill dirt, stones, stone chips, rubble and others compose a highly polluted landscape spatially characterised by large and deep urban 'hole' that create a three-dimensional geography that contrasts with the flat one defined by residential surroundings. These lands are mainly located at the southern/western metropolitan area, involved several communal boundaries and appear as labelled as 'industrial' in metropolitan plans.

One particular case is related to the gravel pits located in the boundary between the commune of La Florida and Puente Alto. This is a private property formed by a series of interconnected 'holes' –restricted to public access – in which extraction of raw material is combined with industrial storage of rubble. These industrial activities increase tensions with residents due to air pollution, noise and insecurity. Nevertheless, some holes are being infilled to allow future urbanisations including parks, green spaces and amenities such as swimming pools and promenades, but these ideas are not aligned with central authorities who see the area for social housing developments. At any case, physical restrictions do not allow a totally successful transformation in the short-term. Additionally, and as a boundary area, this interstitial space suggests unprecedented coordination at multiple

levels (Interview 30). This situation is similar to others gravel pits distributed on other suburban communal boundaries (Figure 16).



**Figure 16.** The gravel pits at the boundary between La Florida and Puente Alto (author's photo. May 2014)

#### 6.4.2 Regional interstices and interventions

The regional interstitial space of Santiago still appears as undeveloped and in hand of different ministries – not related to urbanisation processes – such as agriculture, environment and public works. However, it is formally embedded within the ‘metropolitan area’ according to the last modifications of the PRMS that included rural villages and communes located in outer provinces that literally belong to different territorial administrations, physically disconnected but nevertheless equally determined by the metropolitan regulation (see Figure 8 and 11 of chapter 5). These spaces suggest major inter-institutional coordination as they are not only a multi-boundary areas but also multi-institutional.

Different from the metropolitan scale in which an interstice belongs to single owners, the regional space can be a somehow unsorted cluster of landlords – all with different interests – that make them complex and less standardised. These spaces can also be the outcome of several metropolitan

interstices-connected interstices involved in unified projects for major suburban restructuring. This situation was described by the interlinked intervention on the sites of La Platina, Campus Antumapu and the gravel pits of La Florida – all metropolitan spaces – that were joined by a unique large-scale park (the ‘South Park’) to provide services, green areas and infrastructure for southern Santiago. These cases are deeply analysed in next chapter 7 regarding the implications of their different scales.

### **6.5 RELATIONAL CHARACTER OF SANTIAGO’S INTERSTICES**

As argued in chapter 3, the relational character of interstitial spaces is determined by spatial and functional aspects. In spatial terms they can be opened or closed, natural and intervened. Functionally, they can be defined by hard or soft uses that allow them to be more or less accessible. Both aspects – spatial and functional – determine their relationality and thus, their level of integration with the rest of the urban environment (see table 2, chapter 3). So, these two variables should be analysed as interlinked as they can be simultaneously present. So, an interstice can be spatially closed, but nevertheless, functionally soft and thus, with a high level of relationality supported by their functional aspects. Rural lands, for instance, describe activities that in some cases even allow public access (Interview 38; interview 45). Conversely, infrastructural spaces can be spatially open but nevertheless functionally restricted. Considering the multiple combination of these factors, a less clear interstices are those described by ‘conurbations’ considering their mixed land uses and their diverse spatial characteristics. Although this, they are generally open spaces with both hard and soft uses.

#### **6.5.1 Spatial relational interstices**

##### ***The orchards***

A case in point that clearly describe a high level of relationality is the aforementioned ‘Workers and Familial Orchards’, as it is a spatially open and also functionally soft. Although in terms of property regime they can be restricted to public access, they often allow the entrance of social organisations, schools, scholars and others (Interview 44). They used to be spatially visible, permeable, defined by natural elements such as grass, trees, plants and other elements that contribute to the rural atmosphere of the area,

and sustain a constant flux of inputs and outputs related to the series of products commercialised in the metropolitan area and the different institutional interventions from local and international organisations.

This area has a strong agricultural performance from the 40s onwards, and seen as part of the historical evolution of the countryside and Santiago's suburbs (Catalán, et al., 2013). It still preserves historical evidence of social housing models and policies to provide functional self-sufficiency to suburban families. Currently considered as expressions of 'urban agriculture', the area keeps plot sizes of half hectare each, intended for vegetables and animals. Due to a series of political transformations, the area and its families are currently supported by different NGOs and international programs related to food and socio-environmental sustainability. Nevertheless, the orchards are intended to be transformed over time into social housing projects and industries (Interview 41). The area is a functional hub for experiments on small-scale agriculture and community engagement including participation of schools, elderly organisations, local markets, international fairs and exportation of organic food. It appears as a highly integrated environment although restrictions and pressures to be transformed. This case is deeply analysed in chapter 7 in which the aforementioned issues help to disclose its level of relationality at spatial, functional and socio-political terms.

### ***The military aerial base 'El Bosque'***

Another case – totally opposite to the orchards – also defined by their clear spatial and functional aspects is the military aerial base 'El Bosque'. This interstice is located at the southern low-income commune of 'El Bosque' and appears as a spatially closed environment with a hard use defined by military practices and institutional restricted functions. Its spatial characteristics are featured by hard fences and transport infrastructures (railways and motorways). Due to restrictions, the area is totally disconnected to the rest of the urban fabric.

Currently, local and central authorities are negotiating with the Ministry of Defence – specifically the Air Force Division – to acquire a land portion to

be reconverted into urban. In this context, few proposals to create services and educational infrastructures arise to diversify the residential condition of the commune. However, the socio-economic communal profile –determined by the high concentration of poverty – restrains the attraction of private investments and thus, it is highly dependent of central authorities. Additionally, military hierarchies and centralised priorities emerge as constraints in political negotiations aimed to local benefits. Finally, the boundary with the commune of San Bernardo is projected to host a regional railway line that defines inter-municipal coordination at multiple levels but driven by again central interests. So, the transformation of the area is assumed as a long-term process in which – although intentions – the area will remain interstitial, closed and restricted for several years (Interview 29). This case is also analysed in chapter 7 to contrast differing relationalities of interstitial spaces considering that in this case the relational character is reduced to its minimal expression.

### **6.5.2 Functional relational interstices**

#### ***Southern conurbation zones***

Conurbation zones are another category of interstitiality that illustrates different relationalities. Although their general condition as open spaces, they are formed by different sub-interstices and built-up areas with different functionalities. In this vein, conurbations are complex, mixed, semi-(un)regulated environments and somehow ambiguous considering the coexistence of hard and soft uses, closed and totally open spaces, different infrastructures and so, different degrees of functional relationality.

In Santiago, these interstices are placed on fringe/belt areas describing the ultimate stage of dispersed suburbanisation and mainly determined by a mix of residential, industrial and agricultural functions. On these areas different sorts of housing projects take place –both for upper class and low-income population – and equally defined by low density patterns of detached two/three story houses, transport infrastructure and interspersed rural lands. These areas are a mix of private-public properties, some of them with access to residents but devoid of public spaces and services, some other totally open or totally closed. Also, conurbations are seen as an opportunity to

change trends and to promote more sustainable environments based on the provision of services, connectivity and green spaces, above all in deprived residential areas (Interview 12; Escobar, 2006; Reyes and Figueroa, 2010).

The main factor that drives conurbations is the improvement of transport infrastructure defined by new motorways that connect important outer areas and Santiago. As these infrastructures cross some rural villages, all the spaces in-between become attractive and change their relational character as open and accessible into closed and restricted. Although this, rural villages – fully determined by their residential land-uses – still illustrate high levels of functional and spatial integration and thus, a high relational character. Some other villages, instead, are under transformation as they emerge as preferred locations for industries and so, increasingly changing their relational character due to land privatisation (Interview 35; Interview 26). Cases in points are the conurbation between Maipú and Padre Hurtado structured by the so-called ‘Autopista del Sol’ [The Sun Motorway] and ‘Camino a Melipilla’ [Melipilla Road], and the conurbation between southern Santiago and San Bernardo structured by the ‘Autopista Central’ [Central Motorway]. These cases are deeply analysed in chapter 7 to disclose their properties, complex relational character and their implications in planning.

## **6.6 CONCLUSIONS**

An understanding of the interstitial spaces of Santiago’s sprawl should draw upon diverse elements including their functional and spatial characteristics, relevance and potentials. Different views from different actors evince that interstitial spaces are multifaceted elements in which perceptions are influenced by contextual, economic, cultural and technical factors. All in all, interstitiality is contested – having both positive or negative connotations – and remains undefined in conceptual and practical terms.

Impacts of interstitial spaces are described as environmental, social and economic, and illustrated by their condition as ‘undeveloped’ or marginalised spaces. These conditions are particularly relevant in southern communes that describe high levels of poverty concentration. In this light, interstitial spaces are also seen as opportunities to change trends, improve

urban standards and social housing models, and to rebalance socio-territorial disparities. Due to these factors, some interstitial spaces are considered as more relevant and thus, more visible for the urban agenda.

Relevant interstices are mainly located in southern communes and characterised by good locations, land-capacity and surrounded by high concentration of low-income population and as so, as explicit targets of planning agendas. Less densified spaces near transport infrastructure also emerge as interesting but mainly for private interests. All in all, the scale and level of integration are still crucial aspects to determine relevant interstices.

In this context, metropolitan and regional interstices are described as complex spaces as they involve several institutional interests that suggest improvements on planning politics at different levels. These interstices explain Santiago's urban sprawl from different angles but mainly as outcomes of less controlled processes in planning in which the coordination between different frameworks is still undefined. Their scale impacts are diverse and also their potentials to lead suburban transformations. Furthermore, the relational character of these interstices differs in their spatial and functional aspects. While some of them appear as spatially open, others are closed and isolated environments with diminished relationality.

Thus, some cases are highlighted to be analysed. On the one hand and in terms of scale, the Cerrillos airport site, La Platina, Campus Antumapu and the gravel pits placed on the boundary between La Florida and Puente Alto are signalised as metropolitan and regional interstices that can influence the suburban condition and planning policies. On the other hand, and in terms of relational character, the 'Workers and Familial Orchards' of La Pintana, the military airbase 'El Bosque' and southern conurbations illustrate different levels of relationality. These cases suggest that spatial and functional aspects are relevant to determine the different degrees of (des)integration and their place and influence on the planning agenda. These cases are deeply scrutinised in the next chapter 7, based on the aforementioned aspects and to address the research objectives.

## **7. THE SCALE, RELATIONALITY AND IMPLICATIONS OF INTERSTITIAL SPACES: IN-DEPTH CASE STUDIES**

### **7.1 INTRODUCTION**

Drawing upon ideas discussed in chapter 3, and the empirical base in chapters 5 and 6, in which the origins and determinants, different perceptions and scales and relationality of the interstitial condition are first identified empirically in the case of Santiago, this chapter presents the deeper analysis of seven selected interstices of southern Santiago.

It is framed by the conceptual definition of the interstitiality and the multi-study case methodological approach. In particular, the chapter focuses on the scale at which interstices are manifested and their relational character to provide richer empirical evidence; a richer understanding of suburban interstitiality, its place in the suburban transformation and implications for planning.

What is clear is that Santiago's interstices are not inert or empty spaces, but rather active elements of the suburban sprawl. Also, these spaces could not be understood as homogeneous as they illustrate different origins, degrees of functionality, potentials for transformation, but mainly different scale impacts and relational character that finally determine different levels of integration, visibility in the urban agenda and implications in planning politics. Finally, it is demonstrated that Santiago's interstices are multidimensional and contested spaces, in which multiple institutional interests are in tension – or sometimes reconciled – but generally manifested as absences of planning or important outcomes of uncontrolled urban sprawl.

### **7.2 SELECTING CASES**

Relevant interstices are identified by institutional actors regarding of impacts and potentials transformations. These impacts and potentials are consequently seen as determined by environmental conditions, but also their location (Interview 04; Collier and Venables, 2016), scale and relational character (Interview 33). These aspects are neither exclusive nor isolated and

thus, can be present in each case in different degrees. In this light, the selection of cases according the methodological approach illustrates a comprehensive range of interstitial categories to understand how they differentially affect the suburban performance, and provides enough empirical evidence to address the research questions aimed to clarify their role and implications in planning.

### *Their relevance*

Regarding relevant interstices, institutional actors transversally identified the Cerrillos airport site, La Platina, Campus Antumapu, the gravel pits of La Florida, the rural allotments defined by the orchards of La Pintana, the military airbase ‘El Bosque’ and the conurbation zones of Maipú and Padre Hurtado and Santiago-San Bernardo. As discussed in chapter 6, these interstitial spaces are seen as areas that should be reintegrated considering current impacts – mainly described by their marginal condition – and potentials to trigger major transformations in Santiago’s suburbs at different scales. Indeed, these areas have been part of several projects aimed to integrate them to the city. These projects are also analysed as evidence of policy implications and rationales behind their purposes. These cases have been finally sorted out by their scale and relational character as predominant aspects that define their nature as interstices and implications.

### *Scale*

Selected cases in which the geographical scale appears as a major factor to determine their implications are those that involve several institutional frameworks and administrative boundaries. This definition matches with the understanding of Santiago as a metropolitan area formed by several conurbated communes – each one with its own Major and local authorities – that depicts its metropolitan condition (Aylwin, 1991). Additionally, the idea of metropolitan and regional scale is defined by a land capacity that suggests impacts of interventions beyond local demands (De Mattos, 2001; Chellew, et al., 1973). In this regard, identified interstices are again the Cerrillos airport site, La Platina, Campus Antumapu and the gravel pits of La Florida.

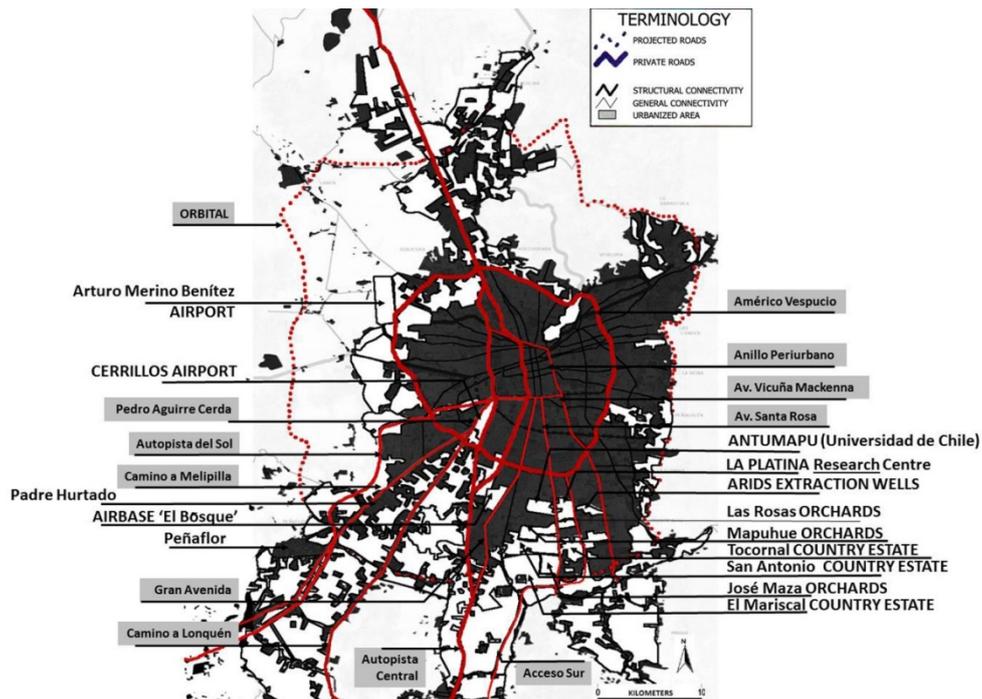
These cases are all seen as marginal and disintegrated spaces with high environmental impacts. However, at the same time they are seen as suitable for large interventions due to their scale – that define their land capacity – their location and surroundings. If they are reintegrated to the (sub)urban landscape they can trigger important transformations in the socio-economic communal profile and restructuration at metropolitan levels. These aspects are transversally considered by central and local planners, developers, residents, policy-makers, scholars and socio-environmental organizations.

These elements placed them in the urban agenda in different terms. Indeed, all of them as constantly a matter of mega-urban projects such as the Cerrillos airport site and the project ‘Ciudad Parque Bicentenario’ (CPB) [Bicentenary Park City] – currently under construction –to transform it in a new sub-centre, or the new metropolitan zoo at La Platina. Also, Campus Antumapu has been matter of sport infrastructure such as stadiums, and the gravel pits are also studied to become park and public facilities. These projects are also disclosed to illustrate the series of political tensions behind their reconversion. These cases are deeply analysed in this chapter to illustrate the implications in planning policies of metropolitan and regional interstitiality.

### ***Relational character***

Regarding the relational character, recognised interstitial spaces are those that illustrate different degrees of interconnection at spatial and functional levels. As previously discussed, the ‘Workers and Familial Orchards’ appears as an open area of soft functionality defined by agricultural practices at small scale. Conversely, the aerial military base ‘El Bosque’ appears as totally closed, with hard uses defined by military practices and thus, with a very limited relationality. Finally, the conurbations of Maipu-Padre Hurtado and Santiago-San Bernardo appear as mixed regional interstices due to the coexistence of closed and open spaces, hard and soft functions and a varied infrastructural performance strongly determined by transport infrastructure, particularly by the ‘Camino a Melipilla’ [Melipilla Road] and the ‘Autopista del Sol’ [Sun Motorway] – all part of the

‘Transantiago’<sup>5</sup> reform (Maillet, 2008) – that connect the city with the rural communes of Padre Hurtado, Peñaflor, Talagante, El Monte, Melipilla, and finally reaches the city of San Antonio at the coast. This peri-urban area is also aimed to be interconnected by a wider ring-road – ‘The Orbital’ (Echeñique, 2006) – currently proposed in plans. All the aforementioned cases are deeply analysed in this chapter to illustrate their transformations, impacts in planning and their place in the urban agenda (Figure 17).



**Figure 17.** Santiago, its main roads/motorways and the interstices (Author’s map based on Echeñique, 2006)

### 7.3 IN-DEPTH CASE STUDIES

The analysis is based on the methodological aspects defined in chapter 3 and aimed to provide enough empirical data to address the research questions. The cases analysed in the next section correspond to those identified as relevant, making special emphasis in their scales and relationality as factor that determine their involvement in planning agendas. On the one hand, the scale – that define the physical capacity of the interstice – suppose major impacts but also potentials to support interventions that respond to local, metropolitan and regional demands.

<sup>5</sup> The ‘Transantiago’ is a modernization of the transport system that includes the creation of new roads and the improvement of existing roads. This has been highly criticised by different sectors due to several problems in implementation. The system is currently operating but is still under revision (see Figueroa and Orellana, 2007; Zegras, 2003).

These spaces disclose a series of implications for planning and the competing perceptions of these spaces and their role and place in the urban agenda. On the other hand, relational interstices disclose the ‘context dependent’ nature of such spaces - strongly linked to different surroundings, infrastructural capacity, functional and spatial aspects. Contextual factors are crucial to understanding to what extent these spaces form an active part of processes of suburban transformations and their chances to become more or less marginalised elements. Finally, interstices are carefully selected to illustrate the influence of different functional categories (Wandl, et al., 2012).

### **7.3.1 Analysing by scale**

The cases used to illustrate the implications of the geographical scale are the Cerrillos airport site, La Platina site, Campus Antumapu and the gravel pits of La Florida/Puente Alto. Considering the research restrictions described in chapter 4, not all of these cases are homogeneously analysed as each one has its own contextual/institutional restrictions and thus, were not equally accessed. Specifically and as mentioned, military facilities and industrial areas were complemented by secondary data and direct interviews with municipal actors. Nevertheless, there is still enough empirical data to address the research questions and aims.

#### **7.3.1.1 CERRILLOS AIRPORT AND INFRASTRUCTURAL LANDS**

The Cerrillos airport site is a recognised metropolitan interstice. Although located at the commune of Cerrillos, it is nevertheless directly adjacent to the communes of Pedro Aguirre Cerda (PAC), Estacion Central and Lo Espejo, sharing their communal limits. These limits are defined by structural roads that connect the site with the rest of Santiago, included in the transport improvement plan ‘Transantiago’. In this case, the ‘Autopista Central’ [Central Motorway] and the Pedro Aguirre Cerda Avenue delimitate the site. The aforementioned – in one of the site corners – splits into two other important roads: ‘Camino a Melipilla’ [Melipilla Road] and ‘Camino a Lonquén’ [Lonquén Road] – all also part of the Trasantiago reform. Other important corridors that circumscribe the site are the so-called ‘Gran Avenida’ [Great Avenue] and the ‘Ruta 5 Sur’ [5 South Road] connected

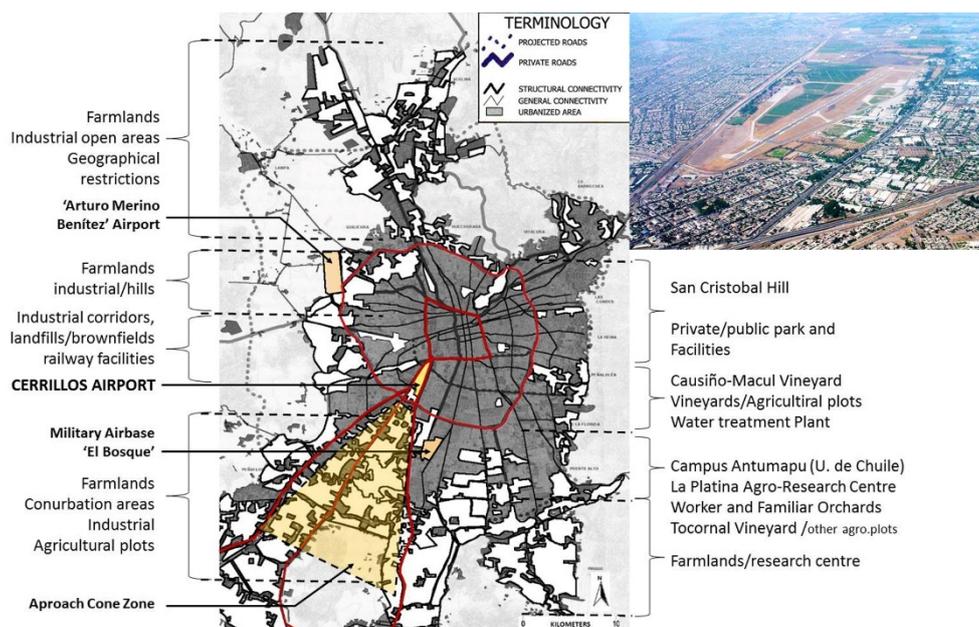
with the aforementioned 'Autopista Central'. Finally, this is the only large-scale interstice located beside the ring-road 'Américo Vespucio' – a recognised boundary between the consolidated city and the area for expansion – that connect all the suburban communes.

The case of the Cerrillos Airport site can be discussed as a common issue in Latin American sprawl– described by suburban landscapes typically found in peripheries of Rio de Janeiro, Sao Paulo, Bogotá, Buenos Aires and Santiago de Chile (Janoschka, 2002) – regarding the role and impacts of metropolitan infrastructural interstices such as airports, railway services, train stations, power and water treatment plants, security buffers, research centres, manufacturer facilities, military bases, industrial storages and others traditionally composed by heavy facilities now included in the suburban fabric (Sabatini and Salcedo, 2007; Romero and Ordenes, 2004; Moreira-Arce, et al., 2015), and as elements of spatial fragmentation that affect the urban condition (Graham and Marvin, 2001).

In this light, these apparently abandoned lands lead to the illusion of new projects as they emerge as opportunities to change urban trends and planning paradigms. Indeed, in the last twenty years public authorities in Chile have considered the improvement of derelict lands based on environmental sustainability and social integration (Ducci, 2014; Tokman, 2006; Zapata and Arias, 2008). However, these reconversions are complex due to their infrastructural nature, the fact that some of them still keep original functions and because of their scale that implies several institutional coexistences. So, these spaces appear as somehow trapped within the suburban environment, in a role as internal boundaries of the urban fabric and characterised by a spatial rigidity that impede their growth. All in all, their decline opens questions about the proper way of exploiting their good locations (Del Piano, 2010; Eliash, 2006; Galilea, 2006; Trivelli, 2006; Valenzuela, 2010), although attempts to recover these infrastructural interstices contradict the expansive tradition – above all in Chile – in which planning rationales and instruments continue to regulate outer developments based on population and employment growth (Gross, 1991; Vallejo and Pardo, 2008).

The interstitial space defined by the ‘Cerrillos Airport’ at the Cerrillos commune, is an underused land currently matter of public debates due to its land-capacity to transform the communal profile and to respond to metropolitan demands. In this context, the announcement of a mega-urban project named as ‘Ciudad Parque Bicentenario’ (CPB) [Bicentenary Park City] arose as solution to transform the area in a sub-centre and as pioneer experience in large-scale urban regeneration. It started in 2001 and was intended to be finished in 2010, fully commanded by the MINVU. However, and after 12 years, the project is still incomplete confirming the hegemony of Santiago’s sprawl and the absences in planning to incorporate these spaces to the urban fabric.

This interstice is an average land of 300 hectares, without restrictions for multiple-land uses and large-scale developments. It is located at the end of the former approach airspace cone – morphologically defined as a relatively open wedge that penetrates the city from the countryside – and at the boundary of the so-called ‘Anillo Periurbano’ [Periurban Ring] delimited by the Américo Vespucio ring-road that connects all the suburban communes of Santiago (Figure 18).



**Figure 18.** At the left, the Santiago’s map and the location of the Cerrillos Airport, the approaching cone, the Anillo Periurbano and the Américo Vespucio ring-road. At the right, the aerial image of the site (author’s map based on Echeñique, 2006; Trivelli, 2006)

This airport was created in 1929 by a donation from the Guggenheim Foundation to promote aeronautical studies. It belonged to the Chilean Air Force and then became the National Chilean Airport (Del Piano, 2010). Originally, its location was in outer reaches of Santiago and surrounded by open countryside. However, because of the expansion and the increasing demand for civilian flights, in 1967 the ‘Arturo Merino Benitez’ airport replaced ‘Cerrillos’ and it was left for minor military practices. Thereby, the area became underused and polluted, but at the same time attractive due to its increasing land value. Over time and as a result of tense coexistences between aeronautical activities and residential surroundings, in 2000 the area was to be revamped and central authorities announced a mega-urban project with explicit intentions of managing the development beyond regulation of private initiatives (Del Piano, 2010). Several policy-makers and professionals were sceptical about the capacity of the State to drive such an initiative given its lack of experience but also because the almost total absence of planning tools to recover vacant lands through mega-urban projects. The only confirmed element was the direct commitment of major authorities, as policy-makers recognise:

The State is not prepared for this sort of project. It is as simple as that. There is no organic support, neither attributions nor budget. Thus, it depends on the leadership of political and technical teams, of our possibilities to convince different actors and align them around common ideas (interview 16).

### ***The CPB project***

In 2001 and led by the minister Jaime Ravinet under presidency of Ricardo Lagos (2000-2006), the MINVU prioritised the importance of recovering the area since it defined a constraint for the metropolitan and communal development. After several negotiations with the Air Force, the total 245 hectares were transferred to be developed and envisaged to duplicate the surrounding density of 50 inhabitants per hectare, apart from adding services and transport. The proposal assumed the restrictions of approaching cone that determined that the south side would remain open to agricultural and industrial uses. The project would be a landmark of socio-residential integration and environmental sustainability as main factors of urban design (Interview 15).

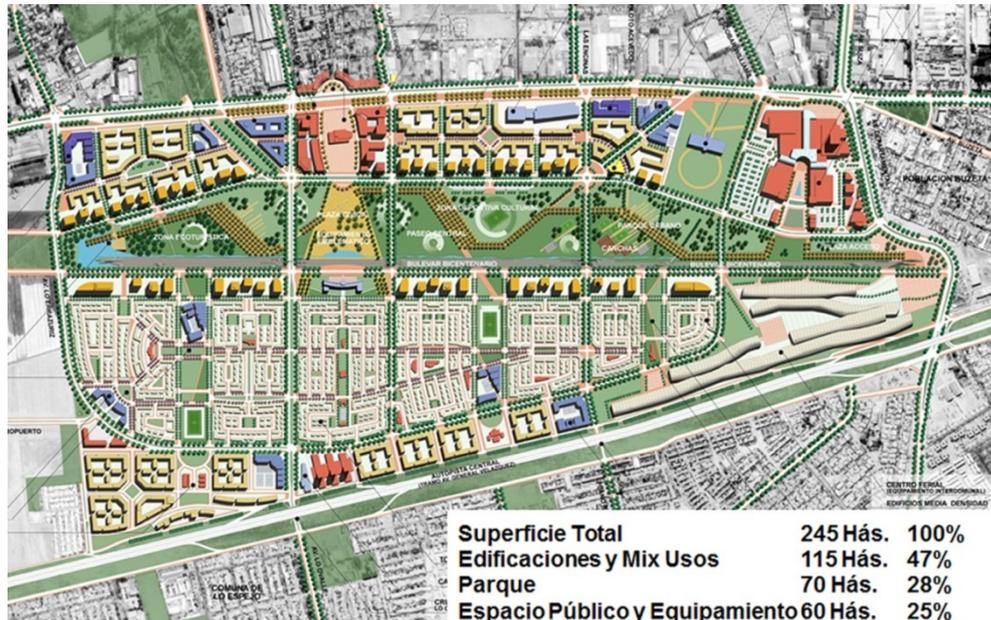
In 2001 central authorities made an international call for ideas based on specific planning principles: high construction standards, social integration, environmental sustainability, multi-functional land uses and flexible urban design as a strategy to deal with market trends. The idea was to create a diverse and innovative environment in comparison to the suburban tradition (Galilea, 2006). This announcement was settled in a period in which several international flagship projects were successful elsewhere – such as the Olympic Games in Barcelona, Puerto Madero in Buenos Aires, the Bilbao Guggenheim museum and the London-Eye in London (Monclús, 2003; Interview 17) – and thus, it would emerge as another suitable icon to commemorate the bicentenary anniversary of the independence of Chile (Interview 15). The project was named as ‘Bicentenary City Park’ and intended to be completed by 2010 (Del Piano, 2010).

After several studies, in 2002 the MINVU defined a general Master Plan that included financial and buildings models. The tender was won by an international consortium and coordinated by a Chilean office for completion by 2005. As the area only had longitudinal roads, the proposal included secondary streets to connect close neighbourhoods (Interview 10). It also defined four spatial morphologies to provide diversity and considered that the State would make small scale urbanisations and a central park to attract real estate investments: an open and dense residential model with mixed land uses nearby a pre-existing road; an open and spatially homogeneous neighbourhood based on two/three stories blocks nearby a 70 hectares park; residential towers and services; social housing neighbourhood nearby the General Velazquez motorway (Interview 09) (figure 19).

### ***Political actions and institutional reactions***

At this stage a first reaction led by private companies emerged, and the Chilean Chamber of Construction (C.Ch.C.) labelled the initiative as ‘unconstitutional’ considering the State’s role in delivering ‘subsidies’ instead of making urban projects (Libertad y Desarrollo Institute, 2004). As the State was assumed to be the owner of the land (specifically managed by the Air Force) and at the same time the deliverer of subsidies, a legal claim

was launched arguing that these conditions generate market distortions and impede proper competitiveness.



**Figure 19.** The Master Plan of CPB at Cerrillos airport site. It shows the Central Park and neighbourhoods (Del Piano, 2010)

This controversy found supporters even inside the government and so, by way of solution the project was delayed to also ensure that other near private investments were sold first, without using competitive advantages of the public machinery in controlling prices, attractors and investments:

The way to push the plan forward was through direct governmental support but there were many ideological detractors. It was seen that the State was commanding an action that is well executed by the private sector and thus was contravening its subsidiary role conferred by the constitution. What was behind the State's action was a seminal real estate operation where the State was the landlord and also controlled market rules. It was considered illegal and so, derived in legal indications (interview 15).

After this and due to changes in the Cabinet, in 2004 the MINVU confirmed the importance of the initiative and the airport was definitely closed. At this stage social organizations expressed their disagreement –particularly a civilian organization of private aviators – and also raised legal objections. So the project was again left in a stalemate for several months (Eliash, 2006). Aviators argued that the city needs more than one airport due to constant emergencies in light of Chile's exposure to natural disasters – such as volcano eruptions and earthquakes – and this infrastructure would be an

alternative in case of the main airport cannot to receive international flights (Interview 25; Interview 10). However, these claims were technically refused as approach cones are indeed superposed and thus, not allowed by international aerial regulations (Interview 31). Alternative landings in emergencies are also inadequate because of its proximity to the main one. It means that if there is fog in the main airport, for instance, there is also fog in the other one, or need of engineering works in both in case of destructive events (Interview 09). An extra insistence was made from the Guggenheim foundation that argued the donation was to promote aeronautical studies instead of urban development (Interview 16). This claim was also rejected after clarifying that the foundation donated 'money' rather than 'land' so, the State had jurisdiction to determine land-uses for the entire national territory. Finally, the Service of Housing and Urbanisation (SERVIU) acquired the lands and transformed the area into public property (Interview 15; Interview 17).

Then the project included a new goal: provide a minimum of a 20% of affordable housing to ensure social integration (named as 'communities of diverse incomes'). Considering there is neither political agreement nor references in Chile about how the social mix is empirically defined, the announcement triggered additional controversies between policy-makers and private interests. Aside from the high urban design standards and the use of renewal energy systems, the financial model had to consider a 'bonus of tolerance' to ensure the social mix. It consists in providing an annual/monthly stipend to middle-income families that live nearby low-income residents. All of these political goals were placed on a weak and poorly defined set of planning institutions and instruments:

Socially, the project should include 20% of social housing developments and we should find a way to achieve it. Then, it should be environmentally sustainable and we saw two working ways: active and passive. It would involve defining the thermal standard of buildings and what could be the best way to produce renewable energy (...), carbon bonuses and park maintenance. The third goal was to achieve a different urban image of good quality, similar to the quality we have in public spaces in the eastern zone of Santiago and without a socially fragmented composition of the different socio-economic strata... in harmony with the concept of social integration imposed by the plan (...). On the other hand, the economic activity would be achieved via a mix of functions to trigger internal and also inter-communal social mobility. It was seen as simply impossible (interview 15).

Finally, the Air Force also asked for compensation to find a new zone for military practices. As such the revamping of the airport site was conceived at different stages to capture land appreciation but what is also clear is that financial and legal pressures also increased over the months (Del Piano, 2010; interview 17).

*The state's position and developers*

Considering this as a first experience in revamping metropolitan interstitial spaces, a special committee was appointed to reinforce planning capacities and to supervise real estate firms' profiles and their design proposals. Private firms assumed that the State would transfer the land to them and then they would provide building models targeted to secure demands. Based on this assumption, all of the proposals converged upon similar socio-economic targets that would deliver homogeneous architectonic typologies. This situation was understood as an outcome of the lack of planning tools to provide clear pathways to move the initiative ahead. A former director of the project explained that:

We did not have instruments and thus, concrete results via the current normative framework. The so-called Conditioned Developments (ZODUC, PDUC),<sup>3</sup> for instance, were not completed at the end. Thus, the normative way by itself does not work. With State projects, it could increase the number of 'ghettos' and so the rate of inequity. (...) In strategic instruments such as the Communal Development Plan (PLADECO) (...), you can read things such as 'the sustainable city' or 'the city with quality of life', etc. but we do not have any empirical evidence... and Cerrillos can be the flagship example (interview 15).

Hard discussions emerged regarding architecture and urban design as by-products of market niches or as societal ideals. Accordingly, the ministerial committee refused proposals and defined a design guideline to clarify *social diversity in homogenous architecture*. A controversy regarding the best way to achieve this arose, with divergent views producing definitions in terms of a management model. The current Director of the project expresses it as:

The State should act as a shopping mall. There are good and bad shopping malls. The good one is how it works today (...) that it should have different anchor stores – irrespective of the fact that women's stores are more profitable – because putting different stores together attracts more people and finally the mall has a better performance. On the other hand, a bad mall is where instead of renting the properties they were sold. Then, each landlord will rent its property to the most profitable activity that is women's stores that determine a homogeneous situation (interview 16).

Additionally, the focus on ‘urban design’ as the main field of solutions was highly criticised as it was understood as strict ‘determinism’ and so, a pointless constraint upon developers who needed flexibility to define designs according to their commercial targets. This view was also shared by several policy-makers who questioned the political narrative based on urban design advantages and also the strategies of the initiative, unveiling disparities even inside the same political coalition (Interview 15). The current director of the project sees urban design regulations as a crucial problem and even dismisses design specifications, as they could not allow future adaptations:

Earlier we were thinking that urban design was fundamental. So, everything was designed as if design was the most important for the city. It included streets and norms, the urban image, different elements...but the grace of the city – and of those that are the most beautiful – is its ‘imperfection’ and those that are perfect are finally bad. We should understand that a line that we make today (in a design drawing) can be wiped off tomorrow, and that is part of the city. I believe that the CPB project was aimed to regulate everything, it was too deterministic. It was an ambition of perfection and it does not work. The city is full of imperfections and many of them make the city better! (Interview 16).

### *Local – central disparities*

Reconciling disparities between developers and policy-makers was always seen as a major peril. Central authorities focused on harmonising political goals with financial achievements and thus, local interests were lagged behind pressing issues. This over-attention at central levels undermined the relation with the municipality of Cerrillos, left at the margin of the debate and clearly placed in a political opposition. After debates, the Mayor of Cerrillos and its planning department rejected the proposal of land subdivisions and new tensions emerged within the public sector between central and local authorities. Chilean regulations stipulate that any metropolitan plan should be approved by local instruments matching minimum requirements, but in this case both plans proposed differing densities and the Ministry asked for a modification. However, political misalignments meant that the municipality rejected required densities, higher than proposed by the local plan. So, the plan would be approved only if original densities remain, which finally would imply major changes in financial details of public-private agreements. This resistance was

understood as a political message that would unveil the perils of centralised actions, the empowerment of local attributions but finally the complexity of large-scale areas that involve different institutional representations. So, the MINVU stopped the project again, arguing a lack of loyalty from the municipality to superior goals (interview 15).

In 2006 – with Michelle Bachelet as President and Patricia Poblete leading the MINVU – further tensions arose. The C.Ch.C. again argued against the role of the State as ‘developer’ instead of supporter of private initiatives gained momentum. The call was for private firms to refuse to participate in a project that have the stigma of being characterised by controversies between different actors, legal trials and lack of political alignment. By 2011, the only accomplished work is the central park ‘Parque Bicentenario’ [Bicentenary Park] – a basic green area finally unveiled by President Sebastián Piñera, who belongs to the opposite political coalition. The landing field remains intact and the park is an isolated desert, contrary to envisaged plans and projected images (Figure 20).



**Figure 20.** The uncompleted park ‘Portal Bicentenario’ (author’s image, June 2014)

By 2014, a new management team was appointed with a different strategy of public land concessions. According to the new team, the failure of the project was not related to the structural components of the planning system

but rather with the business model (interview16). Again, a financial rationale is invoked even though the case clearly illustrates the political shortcomings in addressing infrastructural metropolitan interstices. At this new stage, there are assumptions that additional constraints would emerge as some plots were sold to retail firms at a high price (CENCOSUD) making the area unaffordable to low-income families. According to local planners the average price of a property after construction is 20% higher than the original. Additionally, there is a construction charge that increases prices over a 500% in average. Thus, the assumption is that only high income population could afford yet the project is surrounded by residential deprived areas, meaning, in the end, demand for the developments will be slack and so the area is likely to fall into a 'pending' condition again (Interview 28). Considering this risk, the most probable reaction of current landlords will be keep the area undeveloped until market values improve. So, the project seems to be trapped in an uncontrolled uncertainty recognised by central authorities as an outcome of the lack of political will and planning tools to address such interstitial scale (interview 33).

### *Implications of the Cerrillos airport site*

The Cerrillos airport and the CPB project illustrate the absences in integrating metropolitan interstices of infrastructural character. For public authorities, the airport means an opportunity to improve an area and planning practices. However, the CPB project discloses a series of perils linked to financial and political stability, and the 'project-based' rationale behind the understanding of recovering such scales of interstitiality without the proper policy framework and planning instruments. From the perspective of the role of the State in seeking to establish unprecedented new urban standards, this case also illustrates the weight of a tradition of providing for population and employment growth that has led to Santiago's urban sprawl against which innovative goals rely on partial achievements, specific leadership skills and negotiation capacities

#### **7.3.1.2 LA PLATINA**

La Platina is another interstitial space located at the southern commune of La Pintana, recognised by their land size, land capacity and scale impacts

beyond local boundaries. This site is currently well-served by the Transantiago, specifically for the improvement of the ‘Santa Rosa’ Avenue – now transformed into ‘Santa Ana Corridor’ – that connects the whole southern area with the city centre. It crosses the commune of La Pintana just between La Platina site and the Campus Antumapu site, to then connect the Workers and Familial Orchards and some vineyards located at the urban fringes. The gravel pits of La Florida is closer to this corridor but literally touched by the aforementioned structural road ‘Acceso Sur’ [South Access] that connects the city’s core with the main national motorway and the countryside.

‘La Platina’ is a 300-hectare site currently functioning as an agricultural research centre called ‘Experimental Station La Platina’ under administration of the ‘Instituto Nacional de Investigación Agropecuaria’ (INIA) [National Institute of Agricultural Research] – a public-private corporation supported by private funds originally donated by the Rockefeller foundation and the Ministry of Agriculture – that describes a low densification defined by few buildings (laboratories and offices). So, it is mainly an open land used for cultivations and specialised research related to fruits and vegetables, management of plagues and diseases of pre and post-harvest, analysis of maturity, quality and resistance of agricultural products, transport and analysis of water for irrigation and pesticide residue. The centre also hosts the official national bank of vegetal genetic resources (Interview 11).

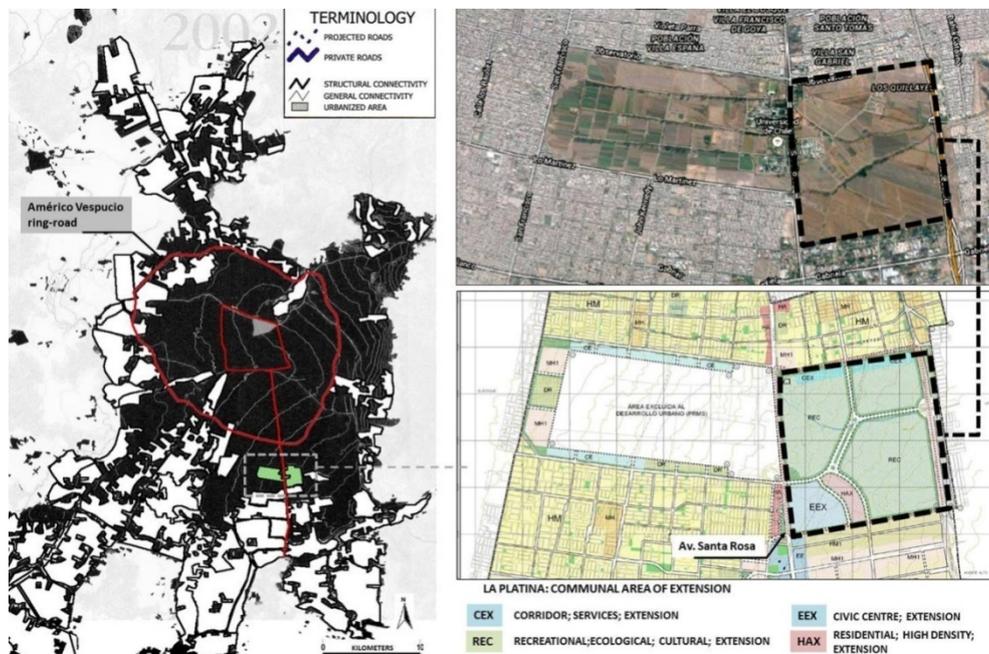
### *Origins, decline and transformations*

La Platina was created by the Ministry of Agriculture and started its research activities in 1959 at 14km from Santiago’s centre and surrounded by open countryside (P. Hinrichsen. Director Research Institute of Agricultural Research, La Platina Personal communication, 20<sup>th</sup> October 2015). It was originally used as a total area for cultivation although research activities were finally placed in no more than 80 hectares (26%). Due to its underused condition, the general land-use has been changed although implementations of new functions are still in a stalemate until the total relocation of the research centre. In this light, 160 hectares are intended to

host a future recreational and cultural complex, 40 hectares are intended to services and housing and only 60 hectares would remain for agricultural research activities. This underused condition is also seen as a problem as it stimulates informal encroachments and illegal occupations (Interview 11).

This site is transversally considered as relevant due to its metropolitan scale and its communal context, characterised by a high concentration of poverty, lack of services and a low rate green spaces in comparison to minimum standards (Interview 03; CONAMA, 2002). Thereby, the most claimed land-use for the site is the creation of an intercommunal park (PLADECO La Pintana, 2012; Ducci, 2002) that includes local, communal and metropolitan requirements.

La Platina is also strategically located in front of the ‘Campus Antumapu’ – another metropolitan interstice of around 320 hectares that belongs to the Universidad de Chile – that hosts the School of Veterinary, Agronomy and Forest Engineering, defining a total land-size of around 620 hectares only separated by the Santa Rosa Avenue – a structural road – that reinforces their strategic location and scale (Interview 04; Interview 55) (Figure 21).



**Figure 21.** At the left, Santiago’s map and the location of La Platina and Campus Antumapu at La Pintana commune. At the right (above), the image of the areas and its densified surroundings. At the right (below), an extract of the Regulator Plan of La Pintana and the land-uses proposed for La Platina (Author’s image based on Echeñique, 2006, Google map visited on October 2015 and the Regulator Plan of La Pintana, 2008)

This strategic condition and land-capacity have been a matter of several initiatives to transform the area considering that it currently presents several administrative, social and environmental problems. However, its transformation supposes a series of inter-institutional coordination between several public institutions that are still in a stage of partial agreement. On the one hand, the INIA complains for the high level of insecurity related to poor surroundings that has historically derived into stolen crops, raw material, informal occupations, crime, fences and spotlights destruction, and the threat to workers, researchers and administrative staff (Interview 11). Additionally – and related to the high level of urbanisation – the intensity of research experiments and cultivation has been diminished and the area becomes underused. On the other hand, the MINVU see the place as suitable for housing targets and the provision of services (Interview 03). However, this intension is totally rejected by local authorities and residents that see the place for services and public parks, to turn the area into a socially less deprived environment and to increase the general urban quality (Interview 55; Interview 48).

Among initiatives for the area, one of the most ambitious was the proposal for a metropolitan park that aimed to join La Platina, Campus Antumapu and the area defined by the gravel pits of La Florida, all as a great interconnected park with local, metropolitan and regional services that even included a new metropolitan Zoo. Studies made by the MINVU – under administration of Jaime Ravinet as Minister (2001-2004) – defined the area as suitable for implementing the so-called ‘Parque Sur’ [South Park] considering a total intercommunal space of around 794 hectares with an impact on about 1.100.000 inhabitants. Financial assessments allowed the provision of green spaces along with sport facilities, lagoons and the Zoo. The proposal would also solve historical derived from the extraction of gravel and others. For the case of La Platina, it would include better quality housing projects with green spaces and for the Antumapu it would remain as a large-scale green area. The proposal also included improvements in connectivity and a significant environmental contribution (EMB Construcción Magazine, 2016) (Figure 22).



**Figure 22.** The sites of Campus Antumapu, La Platina and the gravel pits joined by the master plan 'Parque Sur' (EMB Construcción Magazine, 2016)

Although plans and political interest, the project was not accomplished and left the area immersed within its traditional inertia. Then, the area becomes again a matter of housing development rather than metropolitan services.

Local planners of La Pintana summarise this process as follow:

'We made a study to determine what we can do in these sites – which together are about 600 hectares (referring to La Platina and Campus Antumapu). The analysis was focused not only on the communal scale but also intercommunal. Then and for several reasons, it was determined that the area should be intended to create a large ecological recreational centre, cultural...a mega-park, a park of 'the southern zone', not only for La Pintana...because of environmental reasons such as the lack of green areas. It is known that there is less than 9m<sup>2</sup> per person established by the WHO. After the studies, we realised that there was a coincidence with central authorities – that were looking for a place for relocating the metropolitan zoo – so, we applied to locate it at La Platina. It was analysed and then the MINVU agreed. Then the project and its construction were part of a tender along with the operation of the zoo. The zoo would occupy about 40 hectares but the project was defined for 162 hectares. Nevertheless – and even being tendered twice – there were not applications...i.e. there were some but without success. Almost the whole land of La Platina was bought by the SERVIU...and a small part of the transaction was completed. So, the issue was messed up and after 10 years there is nothing in the place. After that, we received a Sectional Plan to change the recreational land-use to become residential and just a small part would be intended to be a green area. We remained very disappointed. They can do it (the MINVU can fill it with houses) and indeed the Regulator Plan is being modified without our consent' (Interview 24).

This initiative would have a high impact in the planning tradition for its complexity and urban design standards (Interview 54). It was seen as an important environmental, social and economic benefit not only because of its functions – different from residential – but mainly for its symbiotic

relationship with the communal identity based on its rural and environmental character. Additionally, the project would involve several key municipal areas as it was always understood as interdisciplinary and beyond traditional tasks placed on an exclusive department of urban planning, that suggested a series of improvements in municipal coordination, community engagement, social development, e financial and environmental operations:

‘I think in La Platina there is a will for making the necessary changes to fill it with houses. However, I was a supporter of the Metropolitan Zoo. It was an initiative that the municipality raised several years ago and was even supported by the MINVU (Jaime Ravinet), until buying the land and makes the agreements between the Ministry of Agriculture and the Ministry of Public Works. If you see it with a wider perspective, this commune would be in very good conditions to address its challenges and contribute with all associated services to the maintenance of the metropolitan zoo-park. Why? Because the 50% of our territory is rural and able to produce food for animals and all related services. This is a unique condition because we have the rural plots, the farmers (Huerteros), workers, technicians, etc...it would provide permanent local jobs. This project would provide benefits for the whole metropolitan southern zone and would be an attractor of jobs, banks, commerce, etc. Local people would not need to have trips for more than one hour and a half because they could have a job here. Finally, it would hit the mark as a vision of city’ (Interview 54).

### *Differing expectancies on a same place*

This interstitial space is perceived in different forms by different actors. In this vein, La Platina is not a space of consensus and does not invoke similar views in terms of its spatial, physical and environmental characteristics. For residents, its current derelict character is seen as highly negative, a synonym of insecurity. However, is still seen as a space of beauty, nature and perception of the landscape – as originally was – that describe the contradictory and somehow ambiguous character of the place:

‘When we arrived (around ten years ago) the area was (physically) closed. They gave the houses (the Ministry) with a different surrounding and when you look at there...there were crops. It was amazing to look over there! There were marigold fields and when they bloom the landscape become so beautiful! But, from time to time until now, people began to take the fences off, the sticks were so weak. They started to invade the place and then, they stop crops cultivation (the researchers) because people were taken everything’...’people have thrown lots of stuff and it has been also done for people from the other side (indicating another area). We always say that it needs to have something...maybe become urbanised...I do not know’ (Interview 52).

In this light, negative impacts contrast with social benefits. On the one hand, policy-makers, residents and central authorities see the area as negative due

to informal occupations and illegal landfills. These issues emerge as linked to financial difficulties of the INIA to support the maintenance of fences and spotlights during the night that influence the presence of vandalism, drugs and prostitution. So, residents have made a series of claims to the municipality and organised teams to clean the area and to protect adjacent streets and local squares in the meantime (Interview 47). However, the municipality asserts that the area is a 'private' land (outside its jurisdiction) and thus, it should be cleaned by the INIA (Interview 55). At the same time, the INIA claims that the cleaning task is an outcome of uncontrolled social behaviour derived by the concentration of poverty and so, the municipality should provide proper security to avoid informal encroachments, destructions and landfills *inter alia* (Interview 11). As residents assert:

'The place as empty is useful for crime and rubbish. We have seen it so many times. So, we would like to have more people who can care the place...but not houses. It might be a supermarket or a police office. Because the place is suitable for people who want to get drunk...sometimes there are drunken guys or someone throwing rubbish such as empty bottles, braking spotlights to get it dark. It could be a park, but closed and controlled...otherwise it is so dangerous' (Interview 47).

Residents also assert that the place is used to escape from police or to commit offences and crime:

'The place is directly related to drugs. They find a chance here to be hidden (the dealers) and also to take drugs. Then, drugged teenagers go to streets to do bad things...and to get drunk. There is also prostitution over there (indicating an area). Then they come to this area and run away...it is difficult to find them (the dealers) as there is no light, nothing...they are hidden in the bushes...there is also a gorge'...'you can also find stolen cars'...'the whole area should be illuminated and closed' (Interview 49).

Simultaneously, landscape properties are transversally seen as positive. Local authorities describe the place as one of the key environmental elements for the entire metropolitan ecosystem, above all regarding water drainage and air pollution (Interview 37). Additionally, some institutions – such as FAO and environmental NGOs – see the place as a potential 'foodscape' for providing healthy food and encourage participation of local residents (Interview 45). At municipal level, planners and authorities are encouraged to keep the land outside the housing debate, although central authorities see the land for residential developments:

‘...I understand the place is intended to be densified and I disagree with. I think the role of this place is to offer environmental services for the commune and that is very easy to demonstrate. For instance, if you consider the thermal layers of Santiago, you will realise that we (the commune) contribute to the reduction of the metropolitan temperature. Why? Because we hold a large stock of agricultural lands. Here, until noon we have fog because of the ground evapotranspiration that remains open. Thus, when the average temperature in Puente Alto is 4°C higher, here is not (...). Also, natural water drains through underground aquifers that are one of the largest in the region’ (Interview 37).

Similarly, neighbours highlight positive aspects of the area. They recognise the relevance of spatial characteristics such as beautiful views or proximity to the countryside, understood as typically found in high-income neighbourhoods. In some cases, they also suppose potential new uses based on informal occupations perceived as positive:

‘From here it is possible to see the mountain. One can have a look and see the grass that looks beautiful. It was snowing and was just amazing...like to be in the countryside. It is unique. The snow fell over there and you could see everything. The place is good as empty but should be cared. It would be good if it becomes a park with sport fields...with many pitches for the whole family’ (Interview 47).

Residents also see the place as a space of imagination, in which rurality can be found in the middle of a highly urbanised environment:

‘For me...I love the countryside and so, I see this place as a piece of countryside. You can have a better sight of the mountains. From other parts it is not possible! But from here it is possible to see the Andes. Yesterday was snowing and we could see until there! It should be a park. That is obvious. This is a “lung” for Santiago. Moreover, there is no park at all. The closest park is far away from here. It is important not to urbanise everything, everywhere’ (Interview 50).

In this case, the value of the landscape is again seen as the main factor that turn the perception of derelict, vacant, or abandoned into security, social encounters, a venue for families and children:

‘The only positive aspect is the landscape...to go there and feel you are in a clean space. My daughter sometime goes there to play and raise her kite! For the 18<sup>th</sup> of September (the Independence Day) the place is full of people. People come to raise kites, you can see many people. That has a value...the open space is just amazing...these spaces are spaces of freedom’ (Interview 51).

The dual condition of the site appears as contradictory. On the one hand, it is a place of imagination, illusion, beauty, leisure, families, but on the other hand it is dangerous, risky and informal (Figure 23).



**Figure 23.** La Platina site. First, it is possible to see the rubbish and then some bushes, grass, trees and its flat condition. At the back, it is possible to see the Andes Mountains (author's picture, 2014)

### *Implications of La Platina*

The interstice of La Platina is a space with a double condition. On the one hand, it discloses the beauty of the landscape and its positive environmental services. On the other hand, it is a space of insecurity and a stimulus for informality. It is also a highly context-dependent space in which its surroundings are perceived as crucial elements to define the character of the area as a more or less (des)integrated space.

Nevertheless, what is also clear is the fact that such ambiguity and complexity are situated on a metropolitan scale in terms of functions, impacts and potential transformation that nevertheless does not find a place given the lack of a political framework that allows its proper management and future transformation. It is again addressed from a project-based rationale although the land is mainly 'public' and is amenable to known stages of interaction between local and central levels.

#### **7.3.1.3 CAMPUS ANTUMAPU**

'Campus Antumapu' belongs to the Universidad de Chile. It is a public university and so, the site is considered as part of the public land stock. It is a 245,21-hectares property (Plan Regulador Comunal, 2008) located at La



This condition of semi-abandonment is seen by local authorities as negative – as underuse in a well-connected space – and so, they agreed to integrate it to the commune. It is also perceived as a barrier as it impedes public access and internal connections between surroundings neighbourhoods, but it is also seen as positive as it supplies with green space and contributes to the rural atmosphere of the commune (Figure 25).

Despite intensions for changing land-uses, there is still disagreement between the University and the Municipality. On the one hand, the university need to make the land profitable as it is underused, informally encroached and unjustified for current educational purposes. On the other hand, local planners need well-located lands for housing projects. So, the municipality would allow land-use changes only if the university transferred some hectares for social housing. As there is no agreement, the university made a Master Plan with new land-use proposals and rented some portions for private agriculture. As the land is labelled as non-urban, its price is still low and so, attractive for developers who see it as an important land-reservoir. In a similar vein, central government also see the land as attractive for housing projects and public facilities considering current low standards of public space (Interview 18).



**Figure 25.** Campus Antumapu and its landscape (author's picture. June 2014)

*Development proposals*

This site has also been a matter of mega-urban projects. Along with La Platina, Campus Antumapu was considered as part of the ‘Parque Sur’ project [South Park Project] intended to unify the communes of La Pintana, La Florida and Puente Alto through a large-scale park (see Figure 21). In this proposal, Campus Antumapu would provide the land for sport facilities, lagoons, housing and leisure. The proposal would also include a new stadium for the Universidad de Chile football team<sup>7</sup>. In this matter, several architectonic proposals were made considering accessibility, land size and physical properties as suitable site characteristics to support massive encounters. However, as a stadium is also linked to social misbehaviour, institutional and municipal authorities did not approve the project as such activities would trigger negative impacts in a commune mainly formed by low-income population and high rates of criminality (Interview 18; La Tercera – González and Fuenzalida, 2011; La Tercera – Parker, 2014).

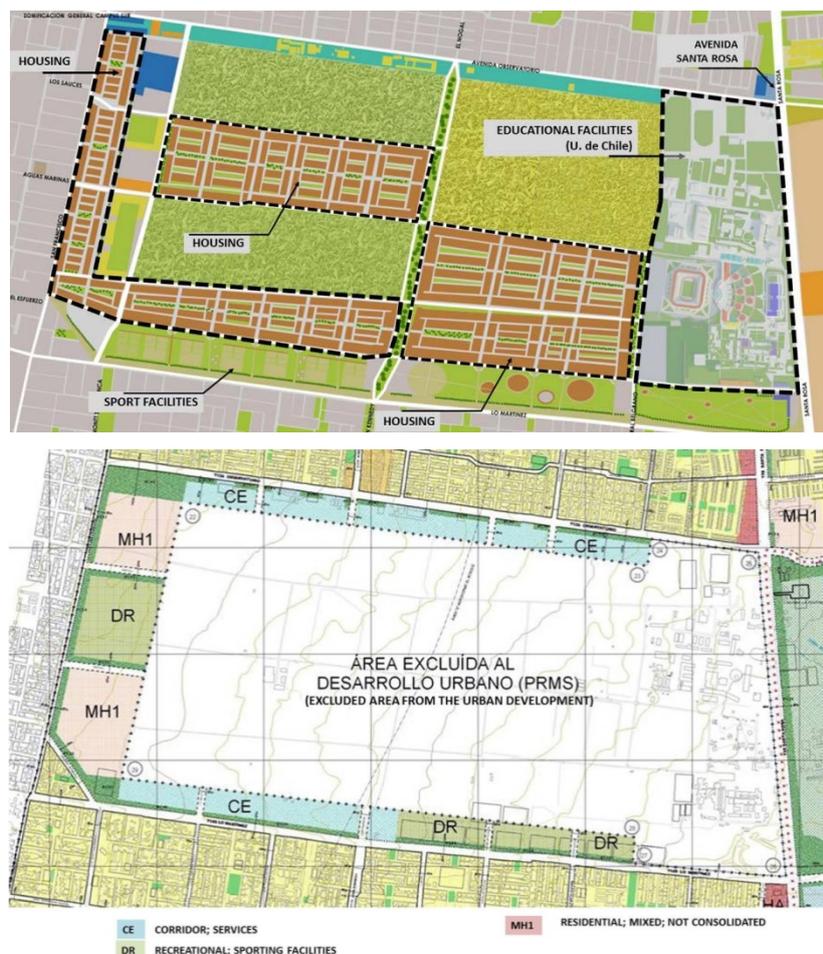
Finally, an updated Master Plan – in agreement with MINVU’s intentions and linked to the local regulator plan – was made that defines a park and residential areas. The plan also allows communal infrastructure at its boundaries, specifically with El Bosque commune. Educational facilities would remain in the same zone, nearby Santa Rosa Avenue. Green spaces would increase land-values and keep rural characteristics. Other areas will be sold to real estate firms to diversify the social composition, contributing to diminish the rate of social segregation. Boundaries made by houses and private properties would define an urban frontage composed by gardens but it would be also a barrier to avoid undesirable encroachments. The idea is to replace the image of an abandoned land by a healthy space. Although there are some minor services in the site’s borders, the Master Plan would redefine the relationship with neighbouring communes and would provide shared services provision at different scales (Interview 18).

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<sup>7</sup>The football team ‘Universidad de Chile’ is a professional football club based in Santiago that plays in the ‘Primera División’. The club was founded on May 24, 1927 and is one of the most successful and popular in Chile. As part of its controversies, the creation of its own stadium led the debate regarding their identity, financial efficiency and institutional support (Club Universidad de Chile, 2015; La Tercera, 2015).

This Master Plan is still under revision as the municipality will change land-uses if they obtain land for social housing. However, one of the key issues is its maintenance and thus, as many others it finally remains abandoned (Interview 18).

So, the Master Plan proposed by the University defined boundary areas for middle-income housing projects – with blocks and detached houses – along with schools, public spaces and security (a police headquarter). Also, the plan includes new internal streets and a stadium for university’s sporting activities. In terms of functions, it coincides with the official regulator plan made by the municipality. However, the spatial distribution changes as the municipality proposes densifying borders to restrict informal occupations (Figure 26).



**Figure 26.** At the top, the Master Plan proposed by Universidad de Chile. Below, the section of the Regulator Plan of La Pintana (U. de Chile. Campus Antumapu. Department of Infrastructure, 2014; Regulator Plan of La Pintana, SECPLA, 2008)

*Implications of Campus Antumapu*

The metropolitan interstice defined by Campus Antumapu is a land that discloses the relevance of this scale of interstitiality in planning to contain the informal encroachment and thus, to define a somehow less related space. In this vein, the prospect of the area is highly determined by the socio-economic nature of its surroundings which influence the potential future land uses of the interstice – although its land capacity suggests connections with metropolitan and regional priorities. Also, it is a spatially open space – full of nature and landscape views – but their surroundings and its institutional character define it as somehow closed.

Although it is a public land, managed by a public institution and under interest of other public institutional actors, the metropolitan scale of the interstice emerges as complex to be managed in terms of maintenance, prospection but mainly its land uses, that are tensioned between its environmental character and suitability for social-housing projects.

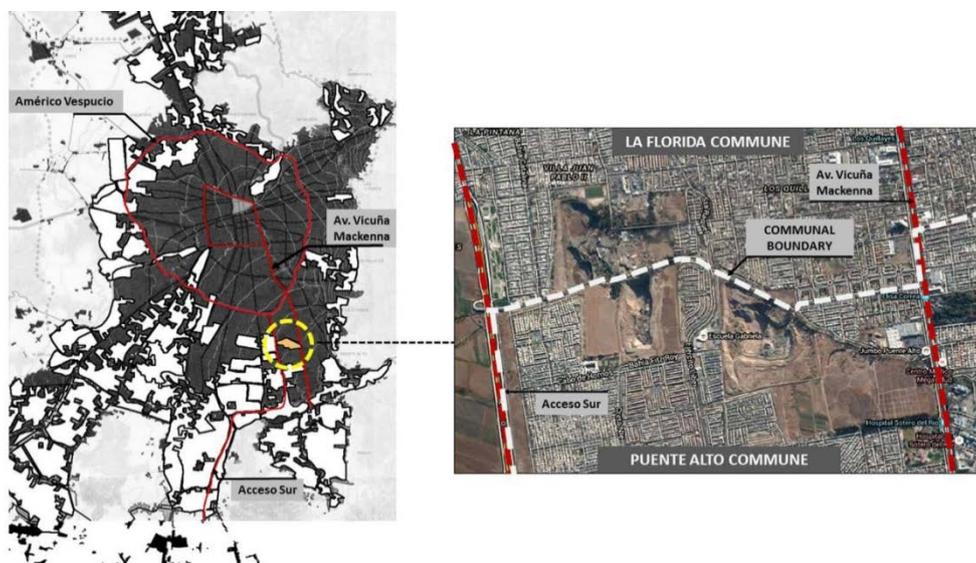
Finally, and as with the other interstices, the transformation of the space is again subject to a project-based rationale which confirms the absence of a proper policy framework to address the integration of metropolitan interstices.

**7.3.1.4 THE GRAVEL PITS OF LA FLORIDA**

The gravel pits of La Florida represent a metropolitan interstice placed just in the administrative boundary between the communes of La Florida and Puente Alto, and is formed by a series of interconnected ‘holes’ – of around 30meter depth – derived from the extraction of raw material – sand, gravel and stones – used for the construction industry. This extractive activity has dragged the soil for years creating a three-dimensional landscape that is currently surrounded by low-income neighbourhoods. This area is close to major avenues and secondary streets that serve the industrial activity and connect residential areas. One of them is the Vicuña Mackena Avenue (that then change to ‘Concha y Toro Avenue’) that connects the city centre and the communes of La Florida and Puente Alto. This Avenue is also part of the Transantiago reform and delimitates the industrial area of the gravel pits

along with the ‘Acceso Sur’ [South Access]. As mentioned, surroundings are mainly defined by low-income neighbourhoods joined to the pits and only separated by local streets and some fences (Figure 27).

This interstice is a group of several private properties that are closed to public access but that nevertheless describes sporadic informal occupations, mainly in its borders due to their unmaintained condition. This zone defines an evident spatial contrast between the flat and homogeneous landscape of detached two/three story houses, and the uneven geography defined by the pits, its depth and environmental characteristics.



**Figure 27.** At the left, Santiago’s map and the location of the gravel pits. At the right, the aerial view of the pits in the boundary of La Florida and Puente Alto (author’s map based on Echeñique, 2006. Image base from Google map visited on October 2015)

Different from the other cases, this interstice is placed in a communal situation that has socio-economic differences in comparison to the rest of southern communes, and also, functional differences as it has been increasingly recognised as an emerging sub-centre that contributes to the more multi-functional character of the area at local and metropolitan scales. La Florida is considered a middle class commune formed by residences, services and infrastructure. It has a population of 365.563 inhabitants (INE, 2005) that represents near the 7% of the metropolitan population in an area of 3.907 hectares. It has a density of 94 people/ha (INE, 2005; MINVU, 2013), slightly over the metropolitan average with 86 people/ha (MINVU, 2013).

The socioeconomic composition indicates that a 9,8% belongs to ABC<sup>8</sup>, 25,1% to C2, 26,0% to C3, 31,1% to D and 8,0% to E (CASEN 2003-2009; AIM, 2008). So, the wider range belongs to C2 and C3 that make a total of 51,1% classified as ‘middle-class’. In the range of poverty (D and E) it reaches a 39,1% considering that only an 8% belongs to extreme poverty in comparison to La Pintana, for instance, with a 20,7% in the range E and a total poverty (D and E) of 75,8% (CASEN 2003-2009; AIM, 2008). This socio-economic characterisation coincides with the average land price, about 5,5UF/m<sup>2</sup> (£134.42)<sup>9</sup>, above La Pintana (£24.44), El Bosque (£58.66), Puente Alto (£56.21), Cerrillos (£39.10), San Bernardo (£19,55) and Maipú (£48.88) and so, defined as one of the highest in southern Santiago. Indeed, although social housing developments from the 70, it is not seen only as a ‘receptor of poverty’<sup>10</sup> but rather as a middle class commune (Interview 30). According to Tapia (2011), between 1979 and 2002 the commune received 23.906 social housing units – although the figures here differ from the data collected by Hidalgo (2007), who asserts that in the same period the commune received 16.080 units representing only 8,07% of the total distribution – that is comparatively lower than Puente Alto, San Bernardo and La Pintana interstice alia (Tapia, 2011; Hidalgo, 2007). As seen, this metropolitan interstice is just placed in the boundary of a low-income and a middle class commune, and in between two of the most populated areas of Santiago.

### *A metropolitan interstice in a suburban sub-centre*

La Florida holds a recognised condition as sub-centre (Sánchez, et al., 2013). It is discussed in the literature on Santiago and its evolution towards

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<sup>8</sup> The ‘Nivel Socio Económico’ (NSE) [Socio Economic Level] and the ‘Grupo Socio Económico’ (GSE) [Socio Economic Group] are nomenclatures to characterise population in accordance to the ‘Socioeconomic Indicator’ that considers salary, domestic goods, properties, type of employment, education level, house and car inter alia. In this light, nomenclature includes AB and C1 (high-income or wealthy), C2 and C3 (middle class) and D, E (poor, very poor). Although different studies could differ in the specific data there is a general consensus about the variables, sources and conclusions.

<sup>9</sup> Chilean land prices are shown in ‘Unidades de Fomento’ (UF), a monetary unit to adjust the Chilean peso to inflation. It is used to maintain a constant value on a daily basis during low inflation. So, land prices appear in UF, estimated by the National Internal Revenue Service (SII) and converted into Sterlings at: [www.xe.com](http://www.xe.com) (accessed in October 2015). This conversion defines a UF value equal to £24.44.

<sup>10</sup> There are two authors that recorded the number of social housing units made in Santiago between the 1979 and 2002 and their locations. Both studies show detailed tables that indicate the number of houses for each commune. However, there is no coincidence between the data presented by the two studies. Hidalgo (2007), for instance, indicates that La Pintana received 23.004 units. However, a more recent figure made by Tapia (2011) indicates that the number of units of La Pintana is equal to 15.396 units. Both authors indicated the MINVU as the main source of data.

a more polycentric character considering its intrinsic nature as formed by several conurbated communes – each one with its own historical centre – that describe potential communal centralities reinforced by large-scale commercial nucleus and well-served by roads (Becerril-Padua, 2000; Rodriguez, 2011; Ortiz and Escolano, 2005). This sub-centrality also alludes to increments on density, land-prices, mobility and workplaces supported by commercial agglomerations (Truffello and Hidalgo, 2015). After the shopping mall's arrival at La Florida, attached activities appeared related to education, health services, leisure and new residential neighbourhoods. So, the communal transformation has been driven by concentration of commercial activities, population increments and consumption power that created a certain degree of functional self-sufficiency (Interview 30). The aforementioned potential has been also recognised by regulator plans – such as the PRMS 1994 – that pointed a sub-centre in the commune (MINVU, 1994). In this scenario, undeveloped lands such as the gravel pits emerge as both a barrier and opportunity, and seen as available land to reinforce the increasingly polycentric identity of the commune.

***The gravel pits, an interstice of discord***

The gravel pits of La Florida/Puente Alto are included within the general classification of industrial lands of Santiago. However, many of these lands are installed in zones not defined for these functions. According to Ducci (2002), the 46,3% (918 ha) of the new industries of Santiago are located in restricted industrial areas, which is a paradoxical situation considering that Santiago still has around 1.200 hectares without occupation in defined zones for exclusive industrial uses (Ducci, 2002). It means that industrial installations are not necessarily determined by the PRMS and are supposedly assessed case by case by central authorities. In a similar vein, Friedman and Necochea (2014), argue that the metropolitan region shows 'An extraordinary freedom of localization, perhaps a policy of industrial and residential dispersion and of transport nets and infrastructure driven from central authorities' (Friedman and Necochea, 2014: 75). In this light and as many, the gravel pits of La Florida were not originated by the regulator plan as it started first and then became labelled as industrial in plans and regulations (Interview 30).

Different from traditional industrial activities mainly placed at the street level, the pits describe an activity that defines an artificial geography shaped as a set of 'urban holes' – comparable with an open mine – in the middle of the suburban landscaped indeed fully surrounded by residential neighbourhoods (Figure 28).



**Figure 28.** One of the gravel pits of La Florida. It is about 30-meters depth. At the back it is possible to see the residential skyline of two story houses (author's picture. May 2014)

As the intensity of the activity has decreased the pits are aimed to be closed. After that, local planners aim to transform the area in a large green space. However, the land is private and thus, planners cannot assume that landlords have the same interest. Indeed, the land would not be profitable as green space and thus, the proposal lacks an economic stimulus. Furthermore, the landscape emerges as a 'geographical accident' and thus, before any use it should be physically rearranged to become available for any construction or permanent activity. At the moment, the area is seen as negative as it appears as a closed and dangerous environment. It is an uneven geography without electric light during the night and its boundaries host informal occupations and landfills. It also generates air pollution due to soil movements and truck circulations that also impacts on streets maintenance, and any project of

improvement supposes leaving the area as restricted for some years due to previous industrial functions that should be tested as inoffensive and without side effects. Also, there is a lack of coincidence between local and metropolitan plans – that labelled the area as ‘green’ and ‘industrial’ respectively – and finally, an extra constraint pertains to the location of the area on the intercommunal boundary between La Florida and Puente Alto that supposes a complex coordination at local levels (Interview 30). In this regard, the municipality of Puente Alto simply considers the area as a geographical accident and so, not allowed for human settlements (Interview 32; PLADECO Puente Alto, 2010). However, the gravel pits are locally labelled as ‘green areas’ and intended to become part of the ‘Green Areas System’ of Santiago that includes metropolitan and intercommunal parks (Interview 30). Indeed, current normative description of the area is:

‘Areas in which there are extractive activities of raw material or abandoned, former landfills and/or affected areas by excavations and/or artificial fillings, established in the article 8.2.1.2 of the PRMS, of soil collapse or settlements identified as zone R5. These zones can be transformed into green areas or sporting and recreational facilities, wells for capturing water’ (Plan Regulador Comunal de Puente Alto, Ordenanza Local, 2002: 12).

Aside from intentions, for local planners the area is a complex space due to its scale. On the one hand, it suggests opportunities related to the land size, inter-communal location, the articulation of highly populated zones, well-served by structural roads, immersed in a sub-centrality and labelled as green infrastructure, but on the other hand it describes a complex geography derived from industrial activities and managed by different private owners, which suggest a long-term infilling and actor’s alignment process (Interview 30; interview 32). Actually, the timeline to finish industrial activities considers around 8 to 10 years including a modification of the PRMS (Interview 30).

### ***Implications of the gravel pits of La Florida***

This metropolitan interstice has a geography determined by industrial activities involving the extraction of raw materials. It is a large empty area surrounded by low-income neighbourhoods and well-connected by roads that suggest proper conditions to be considered as part of integration

schemes. However and despite its strategic location, its physical characteristics impede any intervention to integrate this interstice to the urban fabric. In part, it does not only open questions related to the planning tools to address this kind of interstitiality, but also their implication in engineering, landscape and urban design assuming that at the moment the main solution is to infill the area to become flat. It means that – apart from the lack of planning tools and proper policy framework– there is also a constraint for ‘three-dimensional’ interstitial spaces defined by non-standard geographical aspects.

This case also discloses a condition of interstitiality formed by a cluster of private owners that altogether define a closed environment with a diminished relational character – since it is subject to a lack of articulation among the owners and between them and public interests. At any case, private-public interests are clearly misaligned at all levels. It is possible to see this interstitial category in other communes – also in boundary conditions – suggesting that it is a feature quite common to interstitial spaces. However, these lands are not considered as a planning factor and thus, appear as another absence that not only affects their own relationality but also the integration of the whole intercommunal condition (Figure 29).



**Figure 29.** One of the arid extraction wells located at the communal boundary among the communes of Maipú, Cerrillos and Estación Central (Author’s picture. May 2014)

### 7.3.2 Analysing by relational character

As argued in chapter 3, the relational character provides a sense of to what extent interstitial spaces are more or less integrated to the urban fabric and what could be their influence on the planning agenda. In this regard, Santiago's sprawl has several cases that illustrate different degrees of relationality and how changes on these aspects affect their integration.

To inspect these issues, three cases have been selected. All of them are identified as relevant by different institutional actors, but most importantly, they clearly show the elements of their relational character and implications in planning. The first case – the 'Huertos Obreros y Familiares' [Workers and Familial Orchards] is a clearly open space, with soft function that illustrates a high level of relationality and influence on planning debates. The second case – the military base 'El Bosque' – is a spatially closed environment with hard functions. It clearly shows a diminished relationality. Finally, there are two conurbations zones – Maipu-Padre Hurtado and Santiago-San Bernardo – that illustrate a mixed character with different degrees of relationality defined by differentiated presence of infrastructure and functionalities.

#### 7.3.2.1 'HUERTOS OBREROS Y FAMILIARES'

The case of 'Huertos Obreros y Familiares' (HOF) [Workers and Familial Orchards] is presented as a case that highly influence the debate in planning policies in Chile. This is an open area defined by small scale rural activities – placed on a series of 'orchards' – originally defined by clear policy determinants, legally defined as part of the planning policy framework, immersed in a series of political transformations, currently preserved by different institutional actors and fully connected by a series of infrastructural improvements aimed to connect peripheral areas of Santiago with the city's centre.

The HOF are a set of rural allotments originally defined by rural activities and housing provision. This is an area located at La Pintana Commune originally intended to provide food for local families and the rest of the metropolitan region. However, over time and as a result of the urban

expansion, the area is currently surrounded by residential low-income neighbourhoods and considered as peripheral. Nevertheless, the orchards still keep original activities and also host new functions related to education, leisure, and social activities oriented to promote socio-environmental values of good nutrition, organic food, nature and local knowledge.

Although most of orchards are still managed by original families and descendants, some others have been sold to change land uses to industrial, storage construction material, cars reparation, housing and others. These transformations are based on the perception of the orchards as rural interstices that have good location and land-capacity for new developments. However, the orchards are also recognised by their contributions on issues of urban agriculture, provision of healthy food and medicine, reactivation of local economies, educational spaces and historical heritage in issues of housing and planning policies. Indeed, there is no consensus related to the values of the orchards as an area that should be transformed or preserved, as they are seen as valuable spaces but also as gaps in the current suburban consolidation mainly driven by the housing debate and land privatisation.

All in all, the orchards provide evidence of different level of relationality, determined by both their spatial and functional conditions. This relationality partly explains their resistance to suburban transformations. This is a clear planned space – originally conceived as symbiotic with the city – but nevertheless currently seen as underused and inefficient regarding housing demands. This is the last example of social housing models defined as integrated self-sufficient landscapes, in which ‘residence and workplace’ were conceived as a unified functional unit that still persist over time.

### ***The HOF and (sub)urban agriculture in Santiago***

The HOF are recognised in Santiago as a seminal expression of ‘urban agriculture’ (UA) and thus, as elements that currently illustrate a series of socio-environmental contributions possible to be included in planning policies. The term ‘urban agriculture’ (UA) as such was introduced in the urban debate as counterpoint to massive urbanisation and to save energy and food sources (Madaleno and Gurovich, 2004). It consists in cultivating

vegetables and animal grazing within the city at any space determined as available. So, UA can be settled buildings, residential areas, roads and public spaces at different scales (Xiao-jing and Yu-kun, 2015; Mougeot, 2000). Benefits of UA are identified as economic – as it increases local employability, social – as it requires socio-institutional organisation, ecological – as they provide seasonal and healthy food, environmental – as they provide open and clean green spaces, and political – as they emerge as alternatives for crisis managements and improvement of life conditions. UA also suggests a multidisciplinary approach as it involves issues of agronomy but also landscape management, planning, sociology, economic geography, education and spatial policy inter alia (McClintock, 2010; Xiao-jing and Yu-kun, 2015; De Zeeuw, Gündel and Waibel, 2000; Bourque, 2000). Aside from their doctrinal origins, the evolution of UA has been recognised in global schemes such as UN policies and programs of ‘Food and Agriculture Organization’ division (FAO) and introduced in urban regulations, planning tools and master plans (FAO, 1996; Mougeot, 2000). For the Chilean case and particularly in Santiago, UA is an emerging term used to signalise internal rural spaces that still keep some degrees of agricultural activity. These spaces are controversial in planning as it is mainly adjusted to transform relatively low density spaces but also for the series of functional tensions triggered by differing coexistences of agricultural, industrial or residential uses.

In this light, the rural interstices of southern Santiago are seen as relevant for both new developments and as areas to be preserved. On the one hand, they are well-located near important roads, with good land-capacity, immersed in deprived surroundings currently prioritised to apply social programs, and with still affordable land prices for social housing developments (Interview 03; Interview 33). Indeed, in 2004 the average land-price at La Pintana was equivalent to 1UF m<sup>2</sup> (£24.44), only slightly more expensive than San Bernardo (a neighbouring commune) with an average price of 0,8UF m<sup>2</sup> (£19.43) and at any case significantly lower than the metropolitan average of 5,9UF (£143.965) (Brain and Sabatini, 2006). So, these areas are highly socio-residentially segregated, with a large concentration of poverty and without major physical restrictions to be

urbanised (Interview 12). On the other hand, their ongoing agricultural functions are considered as positive, part of different ecosystem services, fertile soils to provide healthy food and to reactivate local economies, and seen as still affordable lands to accommodate local residents (Interview 44; Interview 46; Sabatini and Salcedo, 2007; Madaleno and Gurovich, 2004).

*The orchards and La Pintana commune*

The HOF of La Pintana are a somehow undensified space embedded in a highly densified commune that reaches a total population of 190.085 inhabitants (INE, 2002), classified as low-income – 75,8% of its population belongs to the most deprived socioeconomic groups D and E (CASEN 2003-2009; AIM, 2008; PLADECO La Pintana, 2012) – and originally urbanised as a result of the massive location of social housing programs during the last 20 years. Indeed and according to Hidalgo (2007), the commune is the second major receptor of social housing developments between 1979 and 2002 – after Puente Alto – concentrating 23.004 units equivalent to 11,54% of the total metropolitan distribution. In this light, La Pintana concentrates almost the 60% of the entire distribution of southern Santiago along with the communes of Puente Alto, San Bernardo, La Florida, Maipú, El Bosque, Cerrillos, Pedro Aguirre Cerda and La Cisterna (Hidalgo, 2007), describing a high concentration of poverty along with a clear lack of services (Hidalgo, 2007; Tapia, 2011; PLADECO La Pintana, 2012).

Regarding environmental properties, the quality of soils is classified as the most fertile of the entire Santiago. Southern communes – and particularly La Pintana – have been classified as without limitations for any cultivation (Ministry of Agriculture, ODEPA, 2012; Ministry of Environment, SINIA, 2012). This condition is critically analysed regarding estimated costs of urban encroachments considering that most of agricultural activities have been competitive and difficult to be recovered once urbanisations have been made (Gutierrez, 1985). However and because of the extension of low-quality neighbourhoods, several agricultural plots have been abandoned and informally encroached (Interview 42). In this context, the orchards appear as still functional agricultural plots and seen as a unique expression of urban

agriculture that describe a tradition of rurality that rely on soil quality, agricultural lifestyles and the support of several social-based actors that understood the place as a valuable patrimony, and as a ‘foodscape’ that support local families and communal demands (Interview 43; Mikkelsen, 2011).

Over time, what started as an outer development has been surrounded by the city and becomes part of a low-income suburban landscape. So, the orchards that compose the HOF were originally conceived as symbiotic with the city but currently perceived as a counterpoint for traditional sprawl. In this light, HOF illustrates the evolution of housing policies and the implications of a ‘planned interstitial space’ that still deploy several lines of relation with the suburban transformation. Thus, relationality emerges as a factor of preservation, resistance and value in the middle of a differing coexistence with traditional suburbanisation. HOF appears as a ‘gap’ within the expansion – embedded within the suburban landscape – and simultaneously present in planning policies. This presence partly responds to its origins and determinants – highly related to societal doctrines – and provides historical evidence of previous and current suburbanisation rationales (Madaleno and Gurovich, 2004). This is identified as a hybrid urban-rural zone that appears as slightly developed and still unexplored on its environmental, social, economic and political potentials.

### *Origins, determinants and evolution of the orchards*

The orchards of La Pintana were proposed in the 30s by central authorities and labour groups. It was part of a societal model that conceived neighbourhoods as productive units composed by houses, lands and local industries.

According to current residents and historical records, this model was a political experiment defined as ‘house and work’ aimed to provide housing solutions for rural communities (Interview 43). Owing to the so far meagre practical know-how and local references, it was considered as an ‘experiment’ inspired on some European experiences from the nineteenth century such as the ‘Suertes del Boalar’ (Aragón, Spain), ‘the

allotments' (England), 'the allmend' (Suiza), the 'Uvre des Jardins Ouvriers' (France), the 'Familiar Orchards' (Russia), 'City Farms' and 'Community Gardens' (The Netherlands), and the 'War Gardens' (UK), all conceived as a response for the lack of food in periods of scarcity, war, or for poor families in the industrial revolution. These experiments were part of a socio-political tradition also supported by ecclesiastic authorities to minimise social disparities through the creation of communal spaces for leisure, educational activities and promotion of moral principles among low-income families (Interview 41; Moran and Hernández, 2011; Barhel, Parker and Ernstson, 2015; Richter, 2013). Nowadays, urban orchards are seen as an expression of 'urban agriculture' and assumed as an established recommendation from the UN to provide food in a variety of contexts (Interview 45; UN-FAO, 1996).

In Chile, the original institutional framework to implement these initiatives was the 'housing cooperative'<sup>11</sup> that coordinated the housing provision with basic livelihoods via local production. Specifically for the orchards, it had its heydays in 1941 with the enactment of the law N° 6.815 – well-known as 'José Maza Law' on behalf of its main promoter, the Senator José Maza Fernández – that defined a fiscal budget to support the orchards, their agricultural production and local industries (Catalán, et al., 2013). The spirit of the law was to reinforce local economies and the sense of community based on agricultural activities, common spaces and goods, and local businesses driven by families. The orchards would be considered as 'urban' as they should be located near the urban ratio and commercial feasibility (Roubelat and Armijo, 2012).

The original morphological structure was defined as a small house placed in a half-hectare land assumed as suitable for family's production. In addition, allotments would share a central space for keeping animals (pigs, horses or cows) as another factor for impelling families' organization (Catalán, et al., 2013). In 1943 the government bought a country estate of 315 hectares to

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<sup>11</sup>'Cooperatives' – originally created in UK (1844) – are organisations aimed to distribute benefits among their members. Seen as a positive figure to increase negotiation capacities and include small parties, it started in Chile in 1853 and was formally legalised in 1924 (Law N° 4.058). 'Housing Cooperatives' were aimed to distribute housing services among its members (Unidad de Estudios. Ministerio de Economía, Fomento y Turismo, Chile, 2014; Etxezarreta and Merino, 2013).

distribute 500 allotments provided by fruit trees and grass. After two years, houses were provided and in 1946 the first 150 families arrived starting their life as urban farmers. In 1951, a second stage of 156 orchards was delivered. In that period the landscape was properly rural and families were dealing with water provision, electricity, sewage and local organization. In parallel, historical buildings and other spaces were labelled as 'heritage' and recovered to host commerce, parks, security, communication services and leisure facilities such as sporting and social clubs. The idea commanded by the cooperatives was to create progressively economic self-sufficient areas (Roubelat and Armijo, 2012). The orchards were finally named as 'Mapuhue', 'José Maza' and 'Las Rosas' and provided with all services:

To start life in the orchards, one of the first actions of the cooperative was to buy to the 'Caja de Habitación Popular'<sup>12</sup> the old landlord's house of the country estate La Pintana – that was transformed in the Headquarter – as well as their storages and cellars. There is a store of the Cooperative and also a cinema; and a nearby park in which a police headquarter was located (Catalán, et al., 2013: 37)

Over time new needs for improvements emerged. First, the demand for food and infrastructure increased. Then, some family members started to work in the city for supplementing incomes. Additionally, different identities emerged due to the specialization of activities (Interview 41). During the 60s, commercialization became complex and other governmental institutions – such as the 'Instituto de Desarrollo Agropecuario' (INDAP) [Institute for Agricultural Development] and the 'Corporación de Fomento de la Producción' (CORFO) [Corporation for Promoting Production] provided commercial support and technical training to families. After a while the orchards' residents were identified as 'Huerteros'<sup>13</sup> as well as their lifestyle based on a strong sense of community, respectful for the environment and austerity. These values still remain as factors of identity (Catalán, et al., 2013).

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<sup>12</sup>The 'Caja de Habitación popular' [Popular Housing Bank Loan] was created in 1935, aimed to deliver 27 years loans to low-income families. These loans were conditioned to the land mortgage and centralised on the President of the Republic. It allowed construction of thousands of affordable houses (called 'popular houses') via the law Ley 6.640 that allowed direct loans from banks. In 1943 the 'Caja de Habitación popular' was restructured to build houses with its own budget and tax exemptions to engage participation of real estate firms (MINVU. Available at: [http://www.minvu.cl/aopensite\\_20061113164636.aspx](http://www.minvu.cl/aopensite_20061113164636.aspx). Accessed in July 2016).

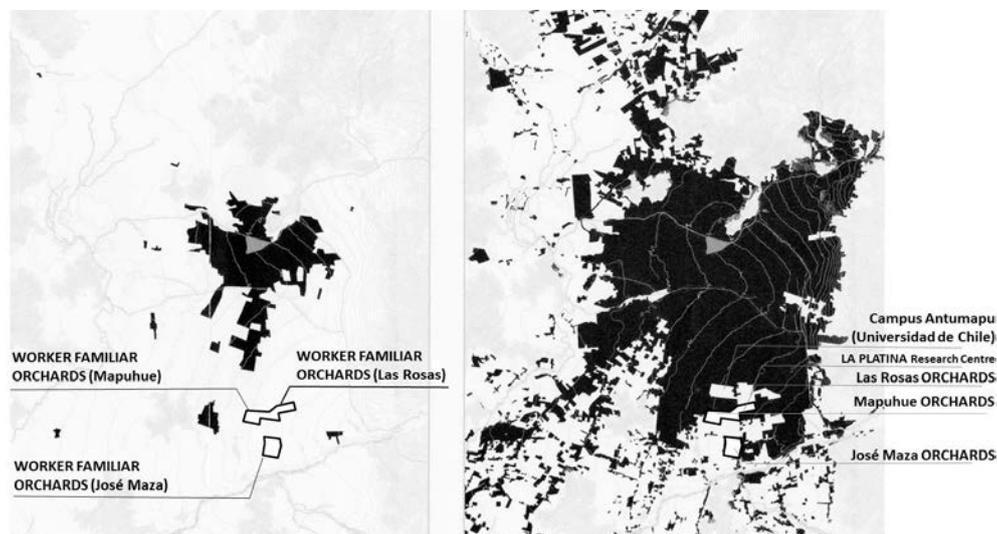
<sup>13</sup>Huertero: a person who lives and works in an orchard.

*Policy changes and suburban transformations*

At the end of the 60s urban expansion reached the orchards and social organisation began to evolve. However, by the 70s this process was drastically altered by a military coup that dismantled almost all the cooperatives along the country and centralised the housing provision on the MINVU (Etxezarreta and Merino, 2013). New political, social and financial frameworks were installed as a result of the installation of a clear neoliberal rationality and the emergence of new marginal population during the 80s and 90s that arrived to the city in the form of slums (Garretón, 1982; Fontaine, 1993). This issue was understood as a consequence of the lack of affordable land and so, in 1979 the MINVU abolished the ‘urban limit’ to increase the land offer and so, decrease land-prices creating the so-called ‘areas of expansion’ that embraced the entire metropolitan region (Petermann, 2006). However, land prices increased and land availability entered into an uncontrolled scarcity. Social housing projects started to be located in outer areas – such as La Pintana – and the provision of infrastructure and services become increasingly difficult. Additionally, centralisation meant that local authorities started to coordinate centralised initiatives and lost representation of local needs (Pavez, 2011; Gross, 1991; Sabatini, 2000). In this scenario, the orchards begun to exponentially be surrounded by low-income neighbourhoods, acquiring and increasingly well-defined interstitial condition.

The housing policy of the this period was understood as a matter of suburbanisation and totally focused on the ‘house’ – now conceived as an infrastructure of ‘sanitisation’ and as an ‘individual private property’ – intended to transform individuals in private owners of a ‘house’ assumed as a market commodity (Gross, 1991; Tapia, 2011). So, the housing provision was externalised and the State began to regulate private operations. General urbanisation provided electricity, sewages, and connectivity to workplaces located in central areas. The new definition of a ‘house’ was based on two key spaces: a basic toilet and kitchen. The rest would be gradually built by the families. This housing model was well-known as ‘sanitary hut solutions’ and its efficiency was highly dependent of families’ skills to reshape it over time, and urbanisation provided by private firms supervised by the State.

However, in most of cases the families did not make the housing extensions in accordance to norms, or simply without proper materials except for different pieces of recycled rubbish. In other cases, the urbanisation was uncompleted or simply not made, creating isolated neighbourhoods of basic shelters. Thus, the final landscape became a mono-functional large scale ‘semi-slum’ of approximately 2.3 million people in which the 22 per cent was relocated at La Pintana for coexisting with small villages and rural allotments such as the HOF (De la Puente, et al., 1990; Valdivia, et al., 2012). By the 80s, almost the whole area was urbanised and several empty spaces were informally occupied. The city reached the orchards and many others agricultural lands (Figure 30).



**Figure 30.** At the left, Santiago in 1940 and the location of the HOF. At the right, Santiago in 2002 and the location of the HOF and other rural plots (author’s maps based on Galetovic and Jordán, 2006)

This (sub)urbanisation pattern defined by new economic and political schemes concentrated poverty and as a result, new social stigmas arose that turned the perception of La Pintana as a fertile rural atmosphere, into a land of poverty, offenses, crime and social insecurity. So, this situation pushed several orchards’ owners to sell their properties to industrial storages. As perceptions of insecurity increased, new actors emerged among the ‘Huerteros’ – such as ‘overnight guards’ – that finally became a permanent jobs that altered traditional social organisation from cooperation to protection. Stolen belongings became part of common issues compelling

‘Huerteros’ to find solutions by themselves based on free deliveries of food for poor people or provision of local jobs (Catalán, et al., 2013).

Concurrently, financial support from central authorities was terminated and orchards’ families entered into the traditional nomenclature of poverty – as well as the rest of the commune – based on the minimum salary, quality of infrastructure and surroundings (AIM, 2012). This period is for orchards’ residents the final stage of an ongoing process of abandonment from the State, not only for them but also for the newcomers considering characteristics of their houses, lands, workplaces and local opportunities:

It started with the government of Frei Montalva and the importation of chickens (...) that competed with Broilers. When the market of capital was born...even within it we were producing. Then, as a result of the opening, new products arrived (importations) and along with them, "the biggest" (alluding to multinationals). But we "the smallest" were working fine until 1964. After that, external products massively arrived, much cheaper. Additionally, the relocation of population started with the so-called "operaciones sitio"<sup>14</sup> and the 'tomas' (*Land Taken*). So, eradications of slums consolidated the arrival of people placed in "sanitization huts". Only the area "El Castillo", for instance, has about 25,000 poor residents. The overcrowding was horrible and crime exponentially grew. Just consider that a social house is about 30 m<sup>2</sup> with a land of 110 m<sup>2</sup>, but these "sanitization huts" were about 2,5m<sup>2</sup> made by basic services (bathroom and kitchen) and then the families should build the rest....so, at the end people built everything wrong, without good quality and for living forever. These eradications were huge...They relocated about 3 million people and this commune received the 22 per cent. In many cases, in those small houses were living up to 12 people, without common spaces, public areas, sport pitches, etc. This entered into a perpetual mistake that derived into extreme familiar violence among other problems (Interview 43).

At the 90sa new political context was defined – that shifted from Pinochet dictatorship to a democratic government in 1989 – and the rates of poverty were assumed as the main political target. However, developments were again driven by the housing agenda as a matter of infrastructure, assuming that poverty can be tackled by a more efficient housing provision. So, once again the HOF as a housing model were left behind pressing issues and simultaneously, real estate firms and central authorities started to see the orchards as well located lands for new developments and industrial facilities. At this point, organised resistance from families emerged to protect their lands along with several social groups seeking to support the

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<sup>14</sup>The so-called ‘Operación Sitio’ [Site Operation] was a housing program implemented by the President Eduardo Frei Montalva (1964). It consisted in the provision of lands with sanitary services to low-income families who should build and improve their own houses (Hidalgo, 2007).

orchards as valuable environmental elements that also contribute to the understanding of urbanisation processes and institutional changes. As a result, the ‘José Maza’ law was not revoked and thus, the orchards still keep their land size and few communal facilities. Nevertheless, financial and technical support is now provided by social organisations, NGOs and municipal departments (Interview 39) (Figure 31).



**Figure 31.** Daily-life picture in one of the allotments at ‘Mapuhue’ orchards (Catalán, Fernandez and Olea, 2013)

### *Current projects and initiatives*

After all and nowadays, NGOs, international agencies and water supply unions support the orchards on water provision, social organization, technical improvements, marketing skills, maintenance of streets and ditches, recycling, cultivation, and manufacturing of by-products such as compost. So, the original purposes focused on food provision have incorporated new goals beyond urban agriculture (Gurovich, 2003), re-classifying orchards as ‘organics’ (to provide organic and seasonal food), ‘educational’ (opened to schools and children) and ‘social’ (public venues for retired people and social encounters). This *de facto* specialisation has been useful to attract municipal assistance, change the political housing-based narrative and increase indicators related to the amount of green spaces per capita (Madaleno and Gurovich, 2004; Interview 39). Thereby, local authorities and residents link the orchards to ‘socio-productive areas’, ‘ecological urban agriculture’, ‘healthy food production’, ‘foodscapes’ and other terms that harmonise with contemporary narratives of environmental sustainability, social benefits, ecosystem services and green infrastructure (Interview 45; Interview 36). This condition as a healthy environment is not

only seen as a competitive distinction but also as a tradition of historical values of respect for nature and identity:

Imagine the promotion of local herbal medicine (horticulture) and also 'Bonsai'. In the Chilean-Japanese Institute they taught us. We had a *Hacer Japonico* and others...there is also people with hens. We are thinking on it too, because they provide clean eggs...but corns they are currently buying are transgenic! They bring it from Argentina and that is absolutely wrong...hens are eating it. So, what we provide to them? All things suggested by experts. Then we took classes of Colloncas and Quetros of how to feed and look after them. We had to provide enough freedom to hens to look for worms, etc. When experts checked our eggs in Canada, they labelled them as simply extraordinary (Interview 39).

Nevertheless and despite supporters, there is still a hegemonic agenda based on market trends and densification. Residents recognise that the protection of the orchards is placed on an asymmetric relation between private and public interests, and assume their lack of agricultural competitiveness. Additionally, if in the past they were necessary as 'food producers' today they appear as 'urban gaps' that can perfectly host new industries and housing. Indeed, pressing issues related to the housing shortage and social insecurity have determined the sales of several plots, land use changes and subdivisions (Interview 41). Also, urbanisation undermined the water provision to irrigate the orchards as continuous pavement affected natural drains, natural streams and corridors that also affected animals' behaviours. Finally, increments of criminality contributed to transform traditionally open spaces into fenced properties equipped with security systems. All in all, the orchards remain as a generally open space that currently hosts more than 6,800 residents in a total land size of 752.29 hectares (9.03 people/ha), are recognised as a very low density and so understood as a totally inefficient land use in comparison with its highly densified surroundings (Table 5).

	Las Rosas	Mapuhue	José Maza	Total or average
Number of plots	189	322	493	1004
Total surface in Ha	134.36	316.60	301.33	752.29
Total population	1,598	2,178	3,083	6,859

**Table 5.** Magnitudes of the interstitial area defined by the HOF (author's table based on Madaleno and Gurovich, 2004)

For residents and social organisations these problems are not only a consequence of the urban expansion but rather the political and institutional

change promoted from both local and central authorities. In this scenario, environmental problems are seen as a lack of systemic view, cross-sector coordination and the nature of appraisal methods that rely solely on financial stability:

For me the way of how we have been advancing (with the urban expansion) towards the south is insane...encroaching agricultural lands that were productive, and we continue filling those places with concrete. When there is a two days rain, everything is flooded. Years ago, when I was a child, it could be raining for a week and nothing happened. Today, water is not drained. When these (new) neighbourhoods – such as El Castillo – have a rain streets become real rivers! And then they get in Santa Rosa Avenue, so they find another river!... (...)...They (local authorities) say that we have to sell our properties, but we always respond ‘please, do not confuse *value* with *price*’. All of these people have planted trees that have around 50 years...they did not come by themselves! Someone did it – your father or your grandfather – so, there are values not reflected in prices! Authorities cannot see it and so, they extend the urban area...even the new people who live around these areas, would they like to have more houses or they prefer the vineyards? (Interview 40).

Specifically for the case of water canals, one of the key problems pertains to the placement of new neighbourhoods over water irrigation pathways. It is a hidden pollution as canals are used for domestic or industrial waste that contaminates an area defined for cultivation or to provide drink water. This happens in some of the orchards sold by new residential and industrial uses:

What happens when the water crosses through these (sold) properties? That is the problem. Workers of the industry, for instance, use the irrigation ditch as a bin for wastes! or when it passes through nearby neighbourhoods it is just used to throw rubbish. People are not aware that the same water is used to irrigate the food that they maybe consume. Canals are passing through properties because when firms build the houses they should keep the canal untouched. It is a right of the ‘canalistas’<sup>15</sup> and so, people coexist with the canal. The canal is an open tract because there is a restriction that does not allow building over it. So, people have an open tract in their properties of at least 2 meters wide from the central axis of the canal to walk and work in case of necessary. But sometimes they build neighbourhoods and do not see the canal...what happen in these cases? Sometimes they (construction firms) pierce the tube and used it as an extra pipe for houses! Then all the rubbish from laundry, etc. is melted with the clean water inside the tube. So, that is why we are asking to displace the tubes to public streets and underground as a way of avoiding any rupture and rubbish (Interview 40).

### ***Active relational spaces***

As seen, these rural landscapes are not inert areas but rather active spaces that can even host seminal conditions of functional self-sufficiency, and that coexist with differing urban dynamics. Indeed, the orchards started as self-sufficient units with its own administrative structure defined by the

<sup>15</sup>Canalista: a person who has the legal right to use the water of a canal for agricultural purposes.

cooperatives, services and local organisation. Although these landscapes currently appear as less developed in comparison to traditional suburban areas, they emerged as more controlled processes of regional planning with clear contributions to urban agriculture, historical transformations of suburbia and planning beyond the housing debate. However, their interstitial condition is not only seen as a physical/spatial absence but also a political absence that has undermined their evolution as more integrated landscapes for both the urban fabric and policy-making processes:

These spaces should be maintained and we should find instruments to incorporate them into the policy. They have a strong cultural link that does not match with a proper institutional figure, so, these areas become 'grey zones', literally hybrid that somehow can be taken by the Ministry of Agriculture. However, there is no institutional framework for 'micro-agriculture' except for exportation. On the other hand, it is not 'city-city' and thus, the MINVU neither has attributions. They only can identify it but their plans and instruments cannot reach it. As the production is not competitive, it is being defined as matter of the Ministry of Social Development. Through this it is possible to apply for benefits as families still classify as 'low-income' and can be part of agendas for tackling poverty. It is functional in this sense but finally not enough as there is no cross-sector support (Interview 45).

Location, multi-functionality, land capacity, historical heritage and social capital emerged as elements of a multifaceted landscape that from the beginning has been highly related to the urban dynamic. Indeed, the orchards began as 'symbiotic' with the city and thus were conceived with a clear high level of relationality. This relational character has not only been defined by their functions – that historically allowed the alternation and transit of different inputs – but also by their spatial elements defined by the natural landscape and its well-connected rural atmosphere.

Although originally the HOF described a 'work-residence' housing model and a foodscape for the city, Santiago's urban sprawl left the area as an interstice – geographically and institutionally – within a socially marginalised landscape in which the relationality with the city shifted towards tense coexistences related to crime and informal encroachments that finally reduced orchards' potentials and benefits:

'If we could introduce urban agriculture linked to parks, public spaces and communal areas, forest lands, educational orchards for schools, you can link it with functions not necessarily narrowed to food production. These can be interconnected and protected areas that do not lose mix of uses and have an

economic impact without losing original rural vocation. They can be another experiment of agricultural usages with services and infrastructure, to understand more literally that they are not outside or delinked to the city. It can reduce marginality in suburban areas' (Interview 45).

As the State's role and the economic model changed, the HOF as well as other rural spaces was diminished by priorities driven by housing demands. However, orchard residents maintained their lifestyles based on a strong sense of community, identity, and historical relevance that helps to understand how transformations in planning politics affect the performance of fringe/belt areas. In this light, the HOF emerges as a relevant testimony of suburban evolution and as a recognised planning experiment in the creation of more self-sufficient suburban landscapes:

'Although the experiment of HOF was founded more on ideological concepts and experiences – more or less successful – from Europe and the United States than local realities, it worth to recognise that irrespective of being a finally a failed experience, it was based on a sort of rationality of urban economy that tried to build an urban-rural transition, encourage a more intensive agricultural exploitation aimed to supply the city and simultaneously alleviate the increasing rural unemployment' (PLADECO 2012-2016, La Pintana, 2012: 47).

### *Implications of the HOF and rural interstices*

The HOF provides enough evidence to understand how changes in planning and politics affect the relational character of interstitial spaces. It suggests that the relationality of interstices is not static and can shift its character depending on contextual changes mainly defined by political and socio-economic factors. It also illustrates the highly context-dependant character of the interstices in which their own nature can determine different degrees of transformation or resistance.

In the case of the HOF, they were conceived as a 'planned space' properly articulated with the urban area in which both urban (housing) and rural (agriculture) functions were simultaneously placed. Also, the HOF acquired its interstitial condition over time with the arrival of the city and drastically changed their relational character from open to somehow fenced spaces. In this vein, the HOF remains as evidence of changes in planning and housing policies, and clarifies the potentials of rural landscapes as specific modes of the production of suburbanisation.

Aside from the fact that rural landscapes are another intrinsic component of urban sprawl, this case illustrates the lack of planning tools of current planning rationales to incorporate these interstitial spaces and to support its high level of relationality.

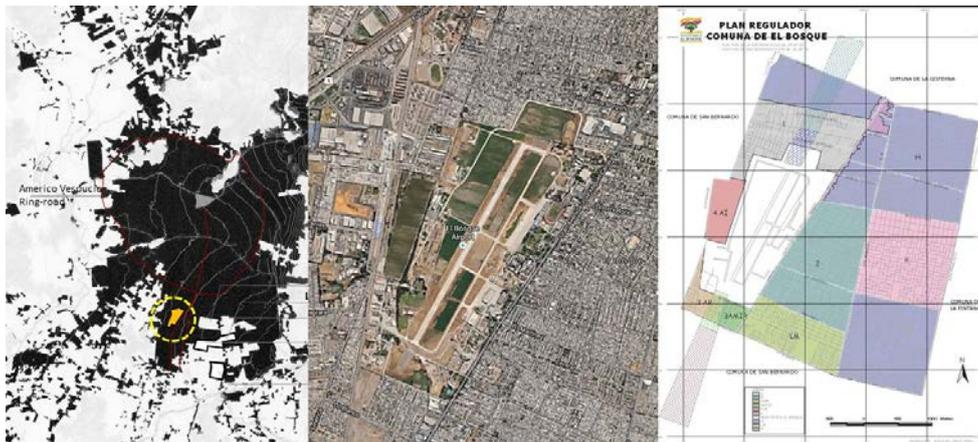
### 7.3.2.2 THE MILITARY AIRBASE 'EL BOSQUE'

This case is somehow an antonym of the previously analysed HOF case. This interstitial space – located at the commune of El Bosque – is defined by a military airbase that still maintains military practices. This is a spatially closed environment – totally fenced – with restricted public access, totally surrounded by low-income neighbourhoods and immersed in one of the poorest communes of southern Santiago.

Although the place is used for minor military practices, it is a large rectangular empty area of about 300 hectares that represents the 17% of the total communal land and so, seen by local authorities as a highly necessary land to be reincorporated to the communal urban development. Its limits are defined by heavy transport infrastructure. At the West, on the boundary with the commune of San Bernardo, there are regional railway lines aimed to transport industrial material from outer industrial areas. The North and South are defined by low-income neighbourhoods and the East is only separated from other residential areas by a structural road, the José Miguel Carrera Avenue that connects the city's centre and further peripheral communes (Figure 31). This interstitial space is placed in the heart of one of the most critical communes in terms of poverty concentration, lack of services and insecurity (Interview 29; CASEN 2003-2009).

As mentioned, 'El Bosque' is one of the most deprived communes of Santiago. It has a population of 175,594 residents (INE, 2005) mainly classified in the Socio Economic Groups (GSE) as C3 (25,4%), D (47,1%) and E (12,7%) and with 13,24% of extreme poverty including homeless people (CASEN 2003-2009; AIM, 2008). This is also consistent with the average land-price that in 2004 reached 2,4UF (£58.55)/m<sup>2</sup> being one of the cheapest and below the metropolitan average of 5,9UF (£143.965) (Brain and Sabatini, 2006). The communal density is about 123 people/ha (INE,

2002; MINVU, PRMS100, 2013) – higher than the metropolitan average of 86 people/ha (MINVU 2013) – and detected as a commune that still describes high levels of residential overcrowding (Interview 32). The communal socio-economic profile has been also historically determined by the relocation of slums and the arrival of relatives of low-income families (CASEN 2003-2009).



**Figure 32.** At the left, Santiago and the location of El Bosque airport. At the centre, the image of the area and its surroundings. At the right, the Regulator Plan of El Bosque (author's image based on Echeñique, 2006; Google map visited on October 2015; I. Municipalidad de El Bosque at: <https://www.imelbosque.cl/portal/index.php/informacion-comunal/plan-regulador>. Accessed in September 2016)

This commune along with Puente Alto, San Bernardo, La Florida, La Granja, La Pintana, Maipú, San Ramón, Cerrillos, La Cisterna and Lo Espejo, has received 143.751 social houses between 1979 and 2002 (of a total of 218.216) representing the 65,8% of the total distribution. El Bosque concentrates 10.304 units representing the 7,16% of the southern Santiago after Puente Alto, San Bernardo, la Florida, La Granja, La Pintana and Maipú (Tapia, 2013; Tapia, 2011). It determined that – considering the administrative limits and the communal size – almost all the communal surrounding around the military base is a continuous low-income residential landscape of two/three story houses. According to local planners, El Bosque is a typical outcome of an expansive and uncontrolled urban development only driven by economic forces and aimed to face the housing shortage. It is seen as contradictory considering the large amount of vacant lands without functions that nevertheless appear as unaffordable for low-income families. In this context, only few available lands are managed by the municipality and the rest belongs to public institutions such as Bienes Nacionales

(Ministry of National Property) or the Ministry of Defence as the case of the military airbase El Bosque (Interview 29).

### *Integration purposes*

Considering that the air base is a recognised underused land that entered in a serious collision with residential functions, the municipality has posited the interest in integrating the land to the urban development. In this light, local authorities and planners are negotiating with the MINVU and the Air Force to reintegrate the area into the commune. This is seen as an advantage for the MINVU that established as presidential goals the construction of 4500 nurseries, housing projects and sport facilities and other services and so, central authorities have offered part of these services to the municipality as long as it provides the land (Interview 3). However, the lack of available municipal land has forced the municipality to ask for support to obtain more stock – with the specific intention of transferring part of the airbase property – and some areas of the communal boundary beside the railway lines. The total land asked for should reach 25 hectares as this is considered enough for future developments and to supply current social demands. This land should be acquired by central authorities and then transferred to the municipality (Interview 29).

This enquiry was raised from local to central authorities due to the clear lack of local capacities to negotiate. As an attempt of improvement and assuming that this is a general disadvantage of southern communes, an intercommunal representation was established called ‘Ciudad Sur’ [Southern City] formed by almost all the southern municipalities to combine political wills and capacities. Although the official representation of the organization relies on Lo Espejo, the series of differing political visions among southern municipalities (often determined by ideological differences) reduced the efficiency of the organization and land achievements was left in a stalemate. Additionally, the lack of continuity of military authorities is an extra restriction as it impedes the flow of information, continuous agreements and their stability over time.

According to local planners, the strongest reason that military authorities have to remain in the area is historical, as it was the first school of military aviators of Santiago established in 1913, along with the first planes for military practices and the delivery of the first degrees issued by the school. Actually, they have a small historical museum – hardly open to the public – and an ongoing construction of new buildings. As random possibilities, some conversations have touched the will to transform the area into a large-scale park – above all because most of the area is underused – but the legal autonomy of the Air Force turned the interest to private developers that offer better profitability (Interview 29).

### *Implications of the military airbase El Bosque*

This case illustrates a highly diminished relationality. On the one hand, the area is spatially closed, guarded and fenced. On the other hand, its functions define restricted access aside from institutional representations. Although there is a museum, it is totally marginal considering the land size and municipal needs.

One aspect that this case discloses is the highly asymmetric scenario of negotiation between actors involved. On the one hand, any potential negotiation is defined by military authorities backed by the Ministry of Defence, their goals (mainly seen as national interest), and its chain of commands that appear as not adjustable to local interests. On the other hand, a low-income municipality with serious needs of services and housing supply must also assume centralised interests and the commitment of ‘consideration’ regarding future services once the land is finally available. It implied an intercommunal arrangement to increase negotiation capacities that nevertheless found its own instability on their own local disparities. This case not only demonstrates that the relational character of an interstitial space can be determined by spatial and functional aspects but also institutional, as military representation closed any form of integration.

### **7.3.2.3 CONURBATION ZONES**

Southern Santiago’s sprawl reached outer rural towns and villages – some of them currently included in the PRMS100. These areas are also matter of

social housing projects, road improvements, upper class housing developments (led by the law N° 3.516/1980) and industrial growth.

In particular, there are some peripheral communes that show a rapid growth and conurbation with small villages. These are the cases of the municipalities of Maipú and Padre Hurtado, and inner areas of the commune of San Bernardo such as Lo Herrera and Nos. These two conurbations are seen as different because the first one is an intercommunal conurbation (Maipu-P. Hurtado) while the second is a conurbation process inside the communal boundaries of San Bernardo.

These conurbations are characterised by some degrees of physical continuity interrupted by different rural open tracts, roads and other infrastructures. In particular, the boundary between Maipú and Padre Hurtado – as well as the boundary between San Bernardo and the village of Lo Herrera – are almost vanished, except for some rural interstices that still hold industrial and agricultural activities.

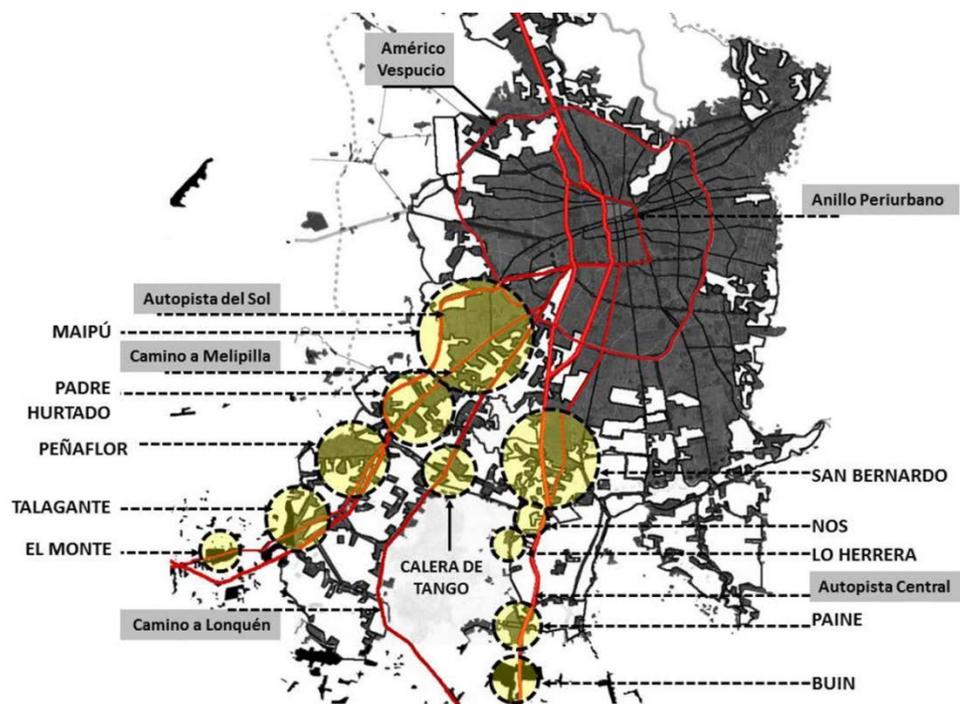
### *Discussing conurbations in Santiago*

The literature about conurbations in Santiago describes them as a metropolitan reconfiguration or as a regional expansion formed by different urbanisations functionally and physically linked (Kassa, 2013). Both refer to urban expansions that reach outer settlements through the occupation of in-between lands that finally defines a semi-urbanised landscape composed by built-up areas and agricultural lands. This understanding does not differ from more general definitions of conurbations in which different political and administrative forms that include local, metropolitan, regional, national and even trans-national scales are possible to be found as part of highly urbanised regions (Mazzoni and Grigorovschi, 2015; Da Costa Braga, et al., 2012; Da Costa Braga and Rigatti, 2009).

Aside from their fragmented morphology, these areas are characterised by a lack of regulation and services that reflects the institutional inattention to any form of development understood as outside the hinterland or the relevant area of political influence (Tomás, 2015; Gilly and Wallet, 2001;

interview 18). Also, these areas are shared spaces between districts and thus, lands of cross-border administration and governance (Ortega, Astrid and Hermida, 2015). Another aspect is described by Kassa (2013), who argues that conurbation zones are determined by geographical proximity, improvements on road system, population growth, the rate of urban sprawl and the relocation of workplaces as attractor of population and employment (Kassa, 2013). In this vein, the whole metropolitan Santiago is defined by the array of conurbated communes with emerging inclusion of peri-rural towns and villages that increasingly concentrate population and employment growth (Figeroa, 2009; Schiappacasse and Müller, 2004; Armijo, 2000). All in all, Santiago's southern conurbations are recognised as somehow 'spontaneous' in which the explosive expansion of Maipú derived its overspill to the neighbouring commune of Padre Hurtado. A similar situation – but inside the communal boundaries – is described by the expansion of San Bernardo that included rural villages in its plans. These two cases are part of wider conurbations in which structural roads lead the urban growth towards outer spaces and unify several traditionally outsider areas (Figure 33).

The conurbation phenomenon in Santiago is seen as a clear outcome of the 'expansive bias' of the MINVU (Galetovic and Jordan, 2006), reinforced by the article N°55/2003 (Ley General de Urbanismo y Construcciones, LGUC) that allows social housing developments beyond the urban limit, even placed on outer towns and villages. Also, continuous population increments that have forced the inclusion of new communal boundaries and communes to the PRMS – such as La Pintana and Puente Alto – have been driven by the construction of neighbourhoods alongside the Vicuña Mackenna Avenue. A similar process is described by La Pintana in which conurbations are determined by the Santa Rosa and Eyzaguirre Avenues. Similarly, the commune of San Bernardo also received population supported by structural connectivity (Autopista Central), and the locality of Padre Hurtado is currently conurbated with Maipú via continuous growth alongside the Road N°78 (that links Santiago with the city-port of San Antonio) (MINVU, 2013).



**Figure 33.** Santiago's southern conurbations (author's map based on Echeñique, 2006)

### *Maipú – Padre Hurtado*

The conurbation between metropolitan Santiago and Padre Hurtado is mainly explained by the rapid growth experienced by the peripheral commune of Maipú – that along with Puente Alto – has concentrated the 70% of the population increment after 1978. Between 1982 and 2002 these two communes were labelled as the most populated in Chile (Tokman, 2006). According to the last Census (2005), Maipú reached a population of 468.390 inhabitants– only after Puente Alto with 492.603 inhabitants – showing a considerable growth of about 82% from 1992 and with an estimated population of 567.804 inhabitants to 2014 (PLADECO Maipú, 2004; Plan Regulador Comunal de Maipú, 2003; INE, 2002).

This population growth is reflected in the construction of massive low and middle-income neighbourhoods that contributed to peripheral land consumption and the increasing proximity between old and new areas. Accordingly, Hidalgo (2007) and Tapia (2011) show a coincidence regarding the massive amount of social housing units located in the area between 1979 and 2002 that reaches near 13.600 units (Hidalgo, 2007; Tapia, 2011). In Maipú, this concentration increased land prices from 0,3UF m<sup>2</sup> (£7,33) in 1990 to 2UF m<sup>2</sup> (£48,88) in 2004 (Brain and Sabatini, 2006)

and incrementally become more oriented to middle class families which can afford bank loans and can obtain subsidies. Because of this rapid growth, the commune was included in the last modification of the PRMS (PRMS100) that generally extended the expansion area in southern Santiago specifically for the communes of San Bernardo, Quilicura, Pudahuel, Puente Alto and La Pintana, finally spanning an extra buildable area of 5.312 hectares for a density of 87,18 people/ha (MINVU, Explicative Report PRMS100, 2013). Accordingly, from 1994, the urbanised area of Maipú reached the boundary of the neighbouring commune of Padre Hurtado that was finally also included within the PRMS100. This boundary is defined by new residential areas – that in the case of Maipú are composed by detached single houses and half hectare plots – and some geographical restrictions such as the Santa Ana de Chena hill and two main roads that connect with southern districts (Camino a Melipilla, km. 20, and Camino a Lonquén) (Plan Regulador Comunal de Maipú, Memoria Explicativa, 2003).

In the case of Padre Hurtado, the communal area spans 8,100 hectares in which the 75% is labelled as rural. The total population reaches 38.768 inhabitants with the 88% located in the urban zone (INE, 2005). The commune has been considered as an attractor for real estate firms due to its proximity with Maipú, its rural lands and its connectivity infrastructure mainly defined by the N° 78 motorway known as the ‘Autopista del Sol’ [Sun Motorway] that connects Santiago and the second national ship port of San Antonio in the coast. Thereby, in 2003 the MINVU implemented the urban scheme called ‘Urban Areas of Prioritised Development’ (AUDP) (see footnote 1, chapter 5, Pp. 118) and indicated that the 35% of the urban zone of Padre Hurtado will be intended to prioritised housing developments that will duplicate the population in the next 10 years (PLADECO Padre Hurtado, Informe Final, Tomo I, 2013).

According to local planners, the area was traditionally defined by informal subdivisions. However, with the implementation of the regulator plan these areas turned into urbanisation/sanitation schemes. So, instead of applying regularizations to traditional rural plots, real estate firms acquired these areas beforehand for housing developments aimed to different socio-

economic profiles. Additionally, some AUDP and upper-class developments were established just outside the communal area to be completed in an average timeline of 10 years. It has forced the updating process of the local regulator plan but most importantly the understanding of local authorities that Padre Hurtado is receiving the overspill of population that Maipú cannot support due to its lack of available land (Interview 35).

These urbanisation processes are not consulted with local authorities as the MINVU has attributions to relocate social housing developments and to indicate where AUDP zones will be located. So, as local authorities are aimed to protect the rural identity and ameliorate impacts from urbanisations (traffic congestion, budget restrictions and others) they started to ask for support in financial and political terms. However, different developments are particular outcomes of private initiatives that entail a potential failure of the general area due to unexpected collapses and lack of regulations:

‘The commune should be in charge of externalities. So, the municipality should consider the street pattern, future extraction of domestic rubbish and the maintenance of green spaces. More importantly is to define the structural connectivity. If not, their own plot subdivisions will have, problems such as congestion, etc – i.e. if real estate firms are not aware of how making road networks linked to the rest of the commune. However, they – as private initiatives – only considered their access to the ‘Autopista del Sol’, completed at the end of the last year. They are in debt with the commune in terms of connectivity...i.e. how they get the road to Melipilla without having impacts in the commune? We have to approve several real estate projects and all of them will get the road to Melipilla...from here and there...without a proper size. This road is not properly designed for this demand; it is a rural road (Interview 35).

Although the local regulator plan considered aforementioned situations, AUDP zones are defined without these factors in future impacts. In part, it is because the local plan regulates a narrow area in comparison to the wider one considered by the metropolitan plan. In this superposition, real estate developments, connections and even industrial facilities (such as a couple of water treatment plants) were installed in the commune without local consultation (Interview 35). So, planning the area between Maipú and Padre Hurtado – as well as others near rural zones – supposes a continuous updating of local plans to include conurbations mainly driven by central

authorities. In this process, sub-interstitial rural spaces are also potentially considered for new urbanisations near regional infrastructure (Figure 34).



**Figure 34.** A rural interstice near the Municipality of Padre Hurtado. At the back, new houses made by MINVU. In front, a regional railway line (author's picture. June, 2014)

### *Santiago – San Bernardo*

The commune of San Bernardo has conurbation zones currently included within PRMS 100. This modification increased the communal available land from 5.400 hectares to almost 9.000 hectares (more than a 70%) defining the 64% for residential uses (Boccardo, 2011).

The expansion of this commune – currently hosting a total population of 246.762 inhabitants (CENSO, 2005) – has been triggered by several factors. First, its condition as receptor of social housing projects that meant a total of 18.168 units between 1979 and 2002 – only below Puente Alto and La Pintana (Hidalgo, 2007). Although this data has a significant variation from Tapia (2011) – who counts 24.906 units in the same period – at any case the commune appears as one of the main receptor along with La Pintana and Puente Alto. Secondly, the commune holds a slow increment in land prices – describing 0,5UF/m<sup>2</sup> (£12,22) in 1990 and 0,8UF m<sup>2</sup> (£19,55) in 2004. These prices are still cheaper than La Pintana (1UF – £24,44) or Maipú (2UF – £48,88) and thus, comparatively attractive for new investments.

These factors determined a socio-economic profile in which the 14,4% of the population are classified as 'E' (very poor) and the 43,4% as 'D' (poor) making a total of 57,8% classified as low-income (AIM, 2008; CENSO 2005).

The urban morphology of the commune is defined by small detached single-houses that require extensive areas for plots distribution and infrastructure. It also seen as a counterpoint for the historical identity aimed at preserving the countryside as a main attractor. Indeed, the commune was founded in 1821 by Bernardo O'Higgins<sup>16</sup> – having a basic urban plan directly driven by O'Higgins – that considered a main square (plaza), a church, rural allotments and patronal houses with a clear rural identity. However, at the beginning of the 20<sup>th</sup> century, railway manufacturers arrived and the working class expansion started. In the same period, the installation of a school of infantry reinforced the densification. Finally and since the 70s, the stock of available rural land was relevant to relocate poor families from slums until today. The commune is also crossed by three important roads that attract housing developments: the José Miguel Carrera Avenue (so-called 'Great Avenue'), the new motorway N° 5 [South Route]– closely connected via important streets – and 'General Velásquez' Avenue. In 1990, a railway service was implemented having three stations within the commune: San Bernardo (centre), Maestranza and Nos that triggered more in-between densifications (Boccardo, 2011). All of these factors reinforced the conurbation with Santiago and created a homogeneous residential landscape only contrasted by high standard services based on its condition as provincial capital of the Maipo province (PLADECO San Bernardo, 2011).

San Bernardo has also changed its urban limits and land-uses to change residential trends and to provide green spaces, connectivity and reconversion of industrial lands. Formally considered as another 'sub-centre' of Santiago, the commune is seen as an independent area with high levels of functional self-sufficiency (PRMS100, Explicative Report, 2014;

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<sup>16</sup> Bernardo O'Higgins is considered as the 'Father of the Nation' and the first President of Chile. He declared the independency of Chile from the Spanish Empire on 18<sup>th</sup> September 1810.

PLADECO San Bernardo, 2011). In this context, the updated regulator plan included a small rural village called 'Lo Herrera' as a new expansion zone – with a projected density of 100 people/ha – and several rural plots for future growth. Some of these lands are labelled as 'special uses' and include buffers of security, underused facilities, military installations, a stadium and sporting fields (Plan Regulador Comunal de San Bernardo and Lo Herrera, 2011). The aforementioned land uses define a commune formed by historical places, industrial lands, restricted zones, new residential areas and a wide set of rural plots between San Bernardo and Lo Herrera, most of them intended to be urbanised (PLADECO San Bernardo, 2011).

According to local authorities and planners, the commune holds several interstitial spaces determined by different reasons. These spaces appear as a result of the successive expansion of communal boundaries that reaches industrial lands, restriction zones, military facilities and heavy infrastructures such as railways services and motorways. In particular, the interstitial space between the urban area of San Bernardo and the village of Nos emerges as relevant as it has a wide stock of land for future growth. Additionally, the PRMS/1994 and its last modification (PRMS100) increased the available land for residential uses in the village of Lo Herrera, considered as the main growth area for future neighbourhoods (Boccardo, 2011). These spaces are not vacant lands as they still have agricultural or industrial functions. Some others nevertheless emerge as geographical restrictions– such as Cerro Chena and other smaller hills – and gravel pits that still keep industrial activity (Interview 26).

The conurbation between San Bernardo and Santiago – that includes the villages of Nos and Lo Herrera – is a diverse patchwork of rural plots, social housing developments and half-hectare residential spaces. It also has interstices determined by physical restrictions, industrial facilities and open tracts that somehow appear as apparently abandoned spaces (Figure 35).



**Figure 35.** An interstitial space in the conurbation zone of San Bernardo, near the village of Lo Herrera (author's picture. June, 2014)

### *Implications of Santiago's conurbation*

As seen, both conurbation processes are driven by population growth in communal areas with good transport infrastructure and available rural lands. Nevertheless and apart from these factors, these conurbations are driven by centralised interests in defining prioritised areas for social housing and continuous updating of metropolitan plans (PRMS). These actions are not coordinated with local actors – neither between intercommunal authorities of Maipu and Padre Hurtado, for instance, or the intra-communal authorities of San Bernardo – and thus, assumed as centralised operations on passive receptors of central interests. In this light, the relational character of these interstices – although defined by their spatial and functional aspects – is nevertheless forced by metropolitan instruments that defined them as open, functionally compatible and institutionally subjugated to central attributions.

## 7.4 CONCLUSIONS

The interstitial spaces of southern Santiago appear as a less planned dimension of the suburban growth, being mostly unexpected outcomes of a somehow unregulated fragmented growth. However, the empirical evidence shows that this inattention is somehow explicit as centralised operations

assume the interstitial spaces as reservoirs for central interests that embrace issues of increasing land privatisation, stock of unregulated inner lands for housing developments, and a clear concentration of demands for services and infrastructural improvements.

The interstitial spaces of Santiago's sprawl are not empty lands. They describe a series of functions, impacts, values and potentials that influence the suburban performance and also disclose a series of absences to incorporate them to the urban fabric and planning. On the one hand, some absences pertain to the lack of institutional coordination to address their multifaceted nature considering their expressions as boundary objects, metropolitan and regional scales, and their emergence on the urban agenda to be intervened and transformed. On the other hand, absences in planning are related to the improvement of their current conditions as they hold negative connotations due to their abandonment and long-standing inactivity. In this scenario, Santiago's interstices are instances of socio-political illusion to change suburban trends and thus, to improve(sub)urban standards. Nevertheless, this illusion is permanently limited by the suburban inertia – mainly adjusted to regulate expansion – and thus, integration of interstitial spaces relies on individual political capacities and contingencies.

As seen, all the interstitial spaces analysed are different in their morphological, functional, geographical and urban characteristics – defining a clear contrast to the homogenous suburbanisation pattern – but mainly in the specificities that determined their nature as metropolitan and regional spaces with different levels of relationality. In terms of scale, these cases disclose the series of political perils and complexities placed at metropolitan magnitudes in order to manage their integration to the suburban fabric, above all considering the functional nature of infrastructural, rural or industrial interstices, and the convergences of differing institutional actors and interest. In terms of their relationality, the evidence disclose that spatial and functional patterns should be matched with their institutional character in order to precise not only their present but also their potential relationality and integration.

## 8. CONCLUSIONS

### 8.1 INTRODUCTION

This research examined the unbuilt geography of urban sprawl. More specifically, it analysed the presence, nature, role and implications of the 'interstitial spaces' in suburban transformations and planning. It starts from the assumption that the unbuilt suburban geography is varied, multifaceted and dynamic, and so, its interstitial spaces are also active elements that participate and influence suburban transformations and planning policies.

As discussed, the research had several limitations at theoretical and empirical levels considering the lack of attention on this unbuilt geography, the reliability of the statistical data and accessibility to inspect some cases of interstitiality. In particular, CENSUS data is still to be updated and thus, the research considered the last official survey from 2002 and updating in 2005. Regarding cases, military and industrial interstices presented difficulties on interviews and site visits. However, these two aspects were supplied by CENSUS projections and alternative institutional sources.

Theoretically, the notion of 'interstitial space' appears as more embracing than other terms found in the literature. Although hardly used in planning circles, it has some advantages over the idea of 'in-between' which arguably does not address the real complexity described by the varied expression of interstitiality. In fact, the idea of 'in-between' is almost reduced to a revisited notion of 'urban sprawl' as a territory 'in-between' the city and the open countryside (Sieverts, 2003). However, the 'interstice' includes the in-between condition but also juxtapositions, hybridisation, intersections, embeddedness, articulations, and even the idea of impurity or strangeness when signalling elements 'out of the norm'. So, its application in planning is much more embracing and better to describe the complexity and the multifaceted expressions of the unbuilt geography. In this light, the metropolitan and regional scales in which interstitiality is manifested appear as those most relevant for considering this complexity of sprawl, including the different levels of integration or relationality that the unbuilt geography of sprawl exhibits.

What is finally demonstrated is that interstitial spaces are non-standard active elements, differently perceived and contested, and that although marginalised they trigger the illusion of being reclaimed and revamped. They are also spaces of resistance and preservation of socio-environmental, political and economic values, and make clear the fact that – regardless of their differential visibility in suburbia – planning tools do not have the political frameworks to include them into the urban fabric and the planning agenda. What the interstices finally suggest is a different category of suburban space and so, an alternative rationale to address their nature as part of urban sprawl.

## **8.2 SANTIAGO AS THE CONTEXT OF ANALYSIS**

Having analysed the determinants of Santiago's sprawl in chapter 5, it is clear that Santiago appears as a suitable context to inspect the interstitiality as it combines specific and general aspects of suburbanisation mainly triggered by planning instruments and policies. In this context, the array of selected cases – apart from embracing different functional categories (agricultural, infrastructural, industrial, others) – provides enough evidence to address the research objectives as they disclose different understandings, natures and implications in suburban transformations and planning. In particular, the southern expansion of Santiago appeared suitable to inspect interstitiality as it describes high rates of relatively homogeneous suburbanisation but also the emergence of planned and unplanned interstices included in plans and also outside regulations.

It is also clear that although planning and the politics surrounding planning have been increasingly standardised, Santiago's interstices are diverse and non-homogeneous elements, and seen as negative or positive depending on their socio-environmental properties and levels of integration. Nevertheless, Santiago's interstices also show common patterns related to their condition as marginalised elements reclaimed or to be reintegrated. In this regard, metropolitan and regional interstices are seen as relevant due to their understandings, locations, land capacity and impacts at different levels. While social-based actors, for instance, see these interstices as suitable for

public facilities and services, policy-makers point to them as suitable for social housing. Similarly, developers perceive interstices as underused lands that should be densified. All in all, the evidence suggests that apart from their origins, role and possible uses, interstitial spaces are finally outside planning and thus, determined by specific social, economic and political circumstances.

### 8.3 EMPIRICAL FINDINGS: ADDRESSING THE RESEARCH OBJECTIVES

The research objectives aim to disclose what the interstitial spaces are, what is their nature, their role in urban sprawl, and their implications for planning. The answers emerge from a combination of data developed in the different chapters, giving special attention to the political factors that each case illustrates in defining their condition as interstices and absences in planning.

*Research objective (1): The concept of ‘interstitial space’ based on insights from the extant literature, considering different understandings operating upon, the different scales, and the relational properties of these spaces.*

Having settled in chapter 2 the existence of the unbuilt geography of urban sprawl as a less addressed dimension that deserves closer inspection considering its meaning and contents, the discussion and definition of the ‘interstitial space’ is deeply developed in chapter 3. Theoretically, there is an important emphasis on the idea that ‘interstitiality’ is not only an ‘in-between’ condition as it also emerges as juxtapositions, intersections, reference to impurities and/or ‘out of the norm’ elements. This wider understanding arrives from an interdisciplinary view of interstitiality in which the term has been used to describe the different expressions in which interstitiality can be manifested. It also helps to address the different functional categories, scales and levels of relationality defined by different interstitial spaces. It is also clear that the array of definitions of the different elements of the unbuilt geography are partial, contradictory or simply do not refer to urban sprawl. In this light, the ‘interstitial space’ clearly emerges as a more generic term that facilitates the interpretation of the different

manifestations of the elements that constitute an unbuilt suburban geography.

In a similar vein but empirically, chapter 6 provides different understandings about Santiago's interstitiality in which different institutional actors refer to these spaces as wasted and 'out of the market' lands, boundary areas, reservoirs and opportunities, but also undefined spaces. It coincides with the theoretical understanding of interstitiality as spaces that cannot be described by current definitions of the built-up space as they are directly assumed as derelict or simply undeveloped. In this chapter, the impacts and the values of interstitial spaces are disclosed along with their relevance and potentials for triggering transformations and integrative processes of suburbanisation.

*Research objective (2): To provide an empirical examination of interstitial spaces of Santiago's urban sprawl considering actors' understandings, determinants, scales and the relational aspects.*

The focus of this objective is to understand the determinants that trigger the appearance of the interstitial spaces and the intrinsic nature of interstitiality. Having established in chapter 3 a preliminary characterisation of interstitial spaces expressed by the geographical scales in which they are manifested and the factors that determine their relational character, more empirically chapter 5 clearly states the determinants that define the origins of Santiago's interstices. In this light, interstitiality appears as strongly related to urban sprawl and the absences in planning defined by the series of technical, instrumental and financial constraints to control suburbanisation.

More directly, chapter 6 provides data of the impacts of interstices at social, economic, environmental and political level that clearly disclose them as active elements of urban sprawl. It unveils the nature of Santiago's interstices as spaces of contradiction, uncertainty but also as opportunities to change suburbanisation trends with different degrees of relationality that also define their relevance in the urban agenda. More specifically, chapter 7 inspects each case considering their scale and relationality providing

empirical data of the series of political perils associated to the scale and relationality. In this chapter the nature of Santiago's interstices as active elements that provide diversity, ecological contents and socio-political meanings is linked again to the absences in planning and their multi-institutional representation that define interstices as spaces of non-consensus and in permanent tension between transformation and reservation.

*Research objective (3): To disclose the implications of interstitial spaces for planning.*

The focus of this objective is to disclose the implications of interstitial spaces for planning policy and practice. Chapter 5 reviewed the different determinants of interstitial spaces and their non-standard origins. Chapter 6 examined the different understandings of these spaces held by different institutional actors. Chapter 7, then, concludes case by case the different implications of the different analysed interstices defined by industrial, military, infrastructural and rural categories. This chapter unveils the fact that metropolitan and regional interstices are multifaceted and active elements of sprawl and that the scale at which they manifest supposes levels of coordination that are actually not supported by planning.

In this light, is it possible to assert that infrastructural interstices define several political perils based on the lack of planning tools to address their reconversion/integration at metropolitan scales (Cerrillos airport). In the case of rural metropolitan interstices, they illustrate a dual positive/negative connotation based on their environmental benefits but also pollution and informality. However and different from Cerrillos airport, rural interstices show higher levels of occupation and potential socio-environmental benefits at different levels that activate the interest of local and central authorities for preserving them (La Platina and Antumapu). Finally, industrial interstices emerge as difficult lands due to their functions and property regime defined by private interests in exploiting primary resources (the gravel pits). These interstices clearly illustrate that planning policies do not provide proper alignment of interests as the area is seen as relevant for integration but nevertheless remains interstitial.

Regarding the relational character of interstitiality, in chapter 7 it is clearly disclosed how functional, spatial but also institutional aspects influence suburban transformations and the place of interstices in the planning agenda. Although conceived as planned spaces, political, functional and spatial transformations left them marginalised and interstitial and thus, changing their level of integration (the case of Orchards). Additionally and although spatially open, functional and institutional restrictions affect the relationality of interstices (El Bosque aerial base). Finally, it is clear that for the case of Santiago, interstitiality is driven by centralised interests irrespective of local attempts to manage its (dis)integration.

#### **8.4 FROM IMPLICATIONS TO CONTRIBUTIONS TO PLANNING**

Having empirically analysed the selected interstices of Santiago's sprawl and their implications for planning, several contributions can be suggested based on the intrinsic nature of the interstitiality and the explicit institutional intentions to reintegrate them as regular elements in suburbanisation. What is clear, is that the understanding of the different dimensions of interstitiality is crucial to define proper planning tools to integrate them and to overcome the series of current absences in planning. Based on the implications, this section discloses this intrinsic nature of interstitial spaces and suggests contributions to planning at different levels.

##### **8.4.1 Understanding interstitiality: what interstices finally are?**

###### ***Unexplored borderlands***

Spatially, interstitial spaces of sprawl are inner borderlands, limits, boundaries or frontiers formed by different elements, spatial instances, and morphological patterns that influence their relational character and level of (dis)integration, and that can define them as autonomous elements in which different functions can take place (Iossifova, 2013). This condition can be characterised by environmental properties but also spatial and functional ones that can provide alternative forms of public space and social benefit (Koohsari, et al., 2015). As inner borderlands, interstitial spaces can stimulate alternative coexistences beyond binomial antagonisms of *built/unbuilt* or *rural/urban* for instance, reinforcing their intrinsic hybrid

character that can be considered as concrete spatial, economic, environmental and political inputs for spatial planning, urban design, landscape planning and geographical analysis *inter alia* (Thierfelder and Kabisch, 2016; Knott, 2016; Chatzidimitriou and Yannas, 2015).

### *Contested spaces*

Politically, interstitial spaces reflect scenarios of differing interests and tensions between preservation and transformation. On the one hand, developers understand interstitiality as underused, undeveloped or less-developed spaces and thus, as necessary to be functionally intensified. On the other hand, central authorities and policy-makers see interstices as barriers that disrupt the continuity of the urban fabric and thus, as spaces that must be converted into well-located social housing developments. For local residents the interstices provide open space for leisure and public activities that reinforce the sense of community and identity. Finally, for local planners interstices are opportunities for services and balancing the scarcity of green space with their consequent environmental benefits. So, this lack of consensus is not only regarding ‘what interstices are’ but also ‘what they could be’ or how they can be developed. In this vein, the only common reaction to deal with disparities is their suitability to stimulate projects that draws the attention of different sectors.

Furthermore, metropolitan and regional interstices rarely relate to single territorial units. They encompass wider territories of multiple levels of administration and interests. These are the cases of the Cerrillos airport site or the gravel pits in the boundary area of La Florida and Puente Alto, or the conurbation between Maipu and Padre Hurtado that supposes inter-municipal and local/central coordination. For the case of the gravel pits, the municipality of La Florida has a clear interest in their reconversion, but the municipality of Puente Alto is still indifferent considering the private regime of the area. The case of the Cerrillos airport and the CPB project is still exploring different ways of political and socio-economic alignment and highly dependent on political authorities. The case of La Platina, was a matter of a metropolitan project conceived as an interstice-communal space that would articulate La Florida, Puente Alto, La Pintana and El Bosque,

and aimed to serve the entire metropolitan region. A similar situation operates for the conurbation between Maipu and Padre Hurtado that describes unregulated encroachments on in-between lands tensioned by attributions of different ministries and urban/rural regulations.

### ***Heterogeneity within homogeneity***

The heterogeneity of interstitial spaces is one of their characteristics at all levels. As seen, interstitial spaces are not homogeneous landscapes. Despite standardisations in planning, interstices emerge from different institutional purposes – agricultural, infrastructural, others – that influence their heterogeneity at different levels. This is also partly defined by their functionality, morphological, environmental and social aspects that determine their diverse relational character. Agricultural spaces, for instance, are clearly more integrated than infrastructural. This heterogeneity also defines their degree of relevance considering impacts at different scales. All in all, the composition of the interstitial geography defines a clear contrast with residential suburbanisation that suggests a different approach to incorporate this heterogeneity beyond traditional regulation of standardised spaces.

### ***Relational diversity***

In a similar vein, suburban interstices express different relational characters with different levels of integration. The Orchards, for instance, have found different modes of adaptation/preservation to remain their relationality regarding transformation of surroundings and planning policies. Conversely, the gravel pits of La Florida showed a lower integration due to their functions and spatial aspects. There is also a lack of institutional representation considering their condition as a cluster of private interests. Thus, diverse relationalities suggest different approaches for addressing their incorporation in suburban transformations based on the analysis of their spatial, functional and institutional aspects.

### ***Active and multifaceted elements of urban sprawl***

There is enough evidence regarding the multifaceted character of interstitial spaces that influence suburban transformation. This partly explains the

complexity in controlling their ecological, infrastructural, economic, social and spatial contents along with their opportunities to divert planning agendas (Pontes and Cardoso, 2016; Saxena and Sharma, 2013; Gandy, 2013; Vejre, Primdahl and Brandt, 2007; Jorgensen and Keenan, 2012; Gabriel, 2016; Kremer and Hamstead, 2015). In this vein, interstices are active elements of resistance and change that challenge planning rationalities of stability and certainty. They embrace all lands that remain inconclusive, uncertain, undetermined, still in transition or in process to reconversion. This, however, contributes to diversify the suburban character as they feed issues on political ecology, ecosystem services, green infrastructure, urban agriculture, regional policy, natural capital and others to converge in a more comprehensive understanding of suburbanisation and sprawl (Kim, 2016; Kim, et al., 2015; Sanches and Pellegrino, 2016; Morckel, 2015; Kremer and Hamstead, 2015; Delgado, 2015).

### *Spaces of imagination*

As part of their multifaceted character, interstitial spaces are not simply physical lands for new developments. Many of them host socio-political aspirations for changing suburban traditions. Indeed and considering the different projects and expectations, these spaces drive the illusion of better environments from different narratives of sustainability or social integration. These imaginaries are multiple and somehow conditioned by institutional representations. Policy-makers, for instance, aspire to transform interstitial spaces into well-located housing developments. Residents imagine public spaces, services and nature. More embracing ambitions try to integrate different imaginaries such as the CPB project. In a similar vein, the gravel pits were matter of parks and green infrastructure. Similarly, La Platina was imagined as a metropolitan Zoo and Campus Antumapu for sport facilities. Although they remain interstitial, from time-to-time they trigger new imaginaries related to their future and the transformation of surroundings.

## **8.4.2 Interstices in policy-making: how they operate in planning?**

### *Overcoming planning by omission*

In the light of the Santiago's interstices, the current planning rationale is seen as the main factor for both the production of suburbanisation and

interstitial spaces. What is distinguished, however, is that planning policies are somehow standard in the intended production of controlled suburbanisation while interstices emerge as heterogeneous and undefined.

This production of interstitiality ‘by omission’ discloses the fact that there remain difficulties with incorporating interstices as functional components of in the wider suburban landscape. This apparently random omission creates differing coexistences between suburbanisation and interstitiality, and finally unveils the suburban condition as an overall unplanned landscape of absences and contingencies. However, in the nature of interstitiality also lies the opportunity to improve planning practices, above all considering its scale of impacts and its relational character that as seen, is not only determined by spatial and functional aspects but also institutional. In this light, the values of interstitiality suggest incremental improvements that open questions regarding the modernisation of planning policies and instruments.

### *Differing relevance*

Not all interstitial spaces influence the urban agenda in the same way. As seen, their scale, relationality and institutional representation operate as strong factors to place them in the public debate and on the political agenda. The aforementioned aspects appear as important considering the complexities to reintegrate them in terms of budget restrictions, market fluctuations, institutional interests and benefits. So, not all the interstices can transversally draw the attention of institutional actors in a given period. Indeed, although some interstices such as La Platina and the Cerrillos airport are considered as relevant (due to their subsequent impacts and lateral benefits beyond communal boundaries such as renovations of nearby neighbourhoods, increments in land values, services, green spaces and social integration), they nevertheless remain interstitial.

### *Context-dependency*

The ‘interstitial’ condition is not a condition by itself. It depends on the elements that define its surroundings. It can emerge as a ‘planned’ element but its interstitial condition only appears with the arrival of a supporting

context. So, an 'interstice' is a context-dependent condition that shapes a relational character between the interstice and its context.

As seen, different disciplines assume this context-dependent condition when using the term to refer to 'accidents', 'impurities', 'out of the norm' or undesirable elements to be removed or reintegrated 'somewhere' and in other cases are even understood as 'bridges' between different situations (Korff, et al., 2015; Philippopoulos, 2016; Lebowitz and Trudeau, 2016; Eckbo, 2015). For urban sprawl, interstitiality derives from suburbanisation defining an inevitable binomial condition in which both geographies – the built-up and the interstitial – interact in different ways. However, and despite the fact that mere (sub)urbanisation does not guarantee it, interstitiality emerges as a counter-space, a by-product of fragmentation that cannot be described purely from the analytical paradigms surrounding suburbanisation. Extending questions from Eckbo (2015) – about the relationship between architecture and landscape – towards sprawl and its interstices, *if suburban sprawl incorporates interstitial spaces, does it then become a semi-built-up or uncompleted space? and if planning is the discipline in charge of understanding the production of urban space, does it terminate where the interstitiality began? does it extend its control and vocabulary over the interstitial territory?* The integration of interstitial spaces also relies on the understanding of their surroundings.

### ***Planning for integration***

It has been shown that there is a lack of planning tools to integrate the interstices of urban sprawl. Assuming that they are heterogeneous, in a first approach their integration suggests specific approaches to deal with their differing characteristics. However, their specificity collides with the nature of planning aimed to regulate standards. In that vein, there are three key factors to address their integration. First, with the reinforcement of the regional scale it embraces the interstitiality beyond specificities. Second, the scale at which they are manifested that can suggest a scalar partitioning in order to deal with smaller magnitudes adjustable to traditional planning. Third, is their relational character in which spatial, functional and institutional aspects must be inspected and intervened. As suggested by

developers and local planners, although this is not a paradigm shift, it allows different attempts for managing interstitiality under incremental reforms towards their integration aside from the hegemony of project-based rationales.

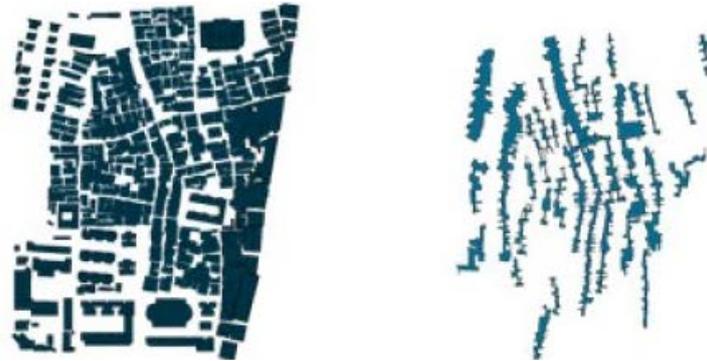
### *Instrumental improvements*

Having disclosed the lack of planning tools to incorporate interstitial spaces, instrumental improvements appear as relevant considering reforms in legislations, policies and articulations between different institutional representations. On the one hand, these improvements can derive in advances beyond traditional zoning, master plans or centralised regulations. In this light, interstices suggest more tactical operations and strategic actions instead of ‘project-based’ operations that rely solely on centralised interests. On the other hand, project-based operations can assume interstitiality as a field of exploration, experimentation to check new urban and infrastructural design theories.

Also, intervention on interstices can be matter of improving evaluations of externalities. There are several cases in which the reconversion of interstitial spaces triggered a series of unexpected externalities – such as the so-called ‘green gentrification’ (Patrick, 2014; Loughran, 2014) – after the creation of new parks and public spaces. So, studies on impacts of the social composition of surroundings, property values or political organisation can provide theoretical and empirical support to size up the risk of undesired outcomes. In a similar vein, in some cases even the connotation of ‘intervention’ itself supposes leaving interstices untouched, empty or simply undeveloped. It makes sense in contexts with high exposition to natural disaster in which interstices can be conceived as ‘planned emptiness’ for facing earthquakes, floods and others.

It can also inspire the creation of new analytical tools to intervene in the different degrees of relationality, the degree of emptiness or aspects such as spatial permeability and others. This instrumentality can arise from the interconnections between different disciplines such as spatial planning, urban geography, urban and landscape design, and can support a better

understanding of project-based rationales. It can also help to detail the variety of aspects of surroundings and contextual situations that define the specificity of the interstitial spaces. Finally, new instruments can define better mappings of the whole interstitial territory in which interstitial spaces are placed and address them as dynamic elements of sprawl (Figure 36).



**Figure 36:** Study of the interstitial spaces (Von Richthofen, A. ‘Urban Village Shenzhen’, Shenzhen Biennale of Architecture 2006. Available at: <http://www.aurelvr.com/content/urban-village-shenzhen>)

### *Cross-sectorial management*

In terms of management, interstices suggest a cross-sectorial articulation beyond planning expertise. Because of their scale, interstitial spaces describe an array of frameworks – local/regional/central, inter-municipal, inter-ministerial and others – that coexist and articulate their preservation/transformation. Interstitiality includes from social-based to central levels with different representations and alternative ways of dominance, property, and socio-political administration that complement the literature on suburban governance and open questions related to the (re)production of suburbia from different disciplines and modes of production (Rottle, 2016; Kabisch, 2015; Foo, et al., 2013; Németh and Langhorst, 2014; Green, et al., 2016; Ernstson, et al., 2010; Fors, et al., 2015).

### *Peripheral diversification*

Interstitial spaces emerge as elements of diversification within the standardised suburban landscape. As seen in southern Santiago, the concentration of social housing developments, the homogeneous socio-economic profile and the presence of standard transport infrastructure define

a clear contrast with the diversity of interstitiality that provides alternative morphologies, benefits, functions and possibilities to articulate surroundings in different ways. The area of La Platina, for instance, is recognised as a place with clear landscape attributes and used by residents as a place for leisure and social encounters. The gravel pits provide a clear three-dimensional spatiality that contrasts with the flat surrounding determined by residences. Conurbation areas are varied and still host agricultural uses. The Cerrillos airport still hosts reminiscences of previous aeronautical functions considered as architectonic patrimony that historical value to the commune.

### ***Financial commodities***

It is clear that some interstices are used as private commodities supported by the taxation framework that stimulates their condition as undeveloped lands, but they are also used for banking foreclosures or loans to be used in parallel business and thus, transferred to financial institutions. Labelled as ‘rural’ – or artificially defined as to be urbanised to support banking loans – these interstitial spaces emerge as created emptiness to maximise financial benefits. Although they are not necessarily located within suburban sprawl, they are spread everywhere and each peripheral commune has a stock of speculative interstices. It is seen as a constraint on housing affordability as it forces the location of social housing developments beyond urban limits. Additionally, a clear characteristic of these areas – in the case of private lands – is their lack of maintenance and so, their high levels of deterioration. This category of interstitiality suggests improvements not only in planning policies but also legislation of property rights, control of land-market speculation and financial taxation to local and central levels are needed.

### ***New insights on cultural heritage***

Interstitial spaces open new perspectives on historical heritage based on the values of unbuilt lands. They reciprocate natural and human ecologies opening unique opportunities for interactions between society, nature and heritage in different forms. On the one hand, new elements of cultural heritage can be released from the historical conditions of interstitial spaces along with their ecological properties. So, apart from their potentials as green infrastructure, interstices define an array of ‘cultural ecosystem

services' (Daniel, et al., 2012; Tengberg, et al., 2012) that reinforce their character also as cultural elements. On the other hand, interstices host historical footprints of previous heydays, keep untouched nature or valuable pauses within the massive suburbanisation process (Gandy, 2013; Kitha and Lyth, 2011; Moreira-Arce, et al., 2014; Wang, et al., 2012; Faludi, 2005).

### ***Regeneration of the emptiness***

The wider comprehension of interstitial spaces can enlarge the view of urban regeneration policies. They used to appear as reclaimed spaces to be filled, but the evidence suggests that their emptiness itself deserves a closer appreciation considering its valued diversity and impacts on surroundings. Theoretical definition of regeneration policies could also consider the 'regeneration of the emptiness' – at different degrees – as a way of promoting alternative perspectives of infilling, densification or activation of suburban lands (Hamilton and Kellett, 2016; Haaland and Van Den Bosch, 2015; Whittemore, 2015; Maruani and Amit-Cohen, 2007).

### ***Interstices 'within' interstices***

Regional interstices – such as conurbation areas – can hold internal interstices. So, sub-interstices, intra-interstices, inner-interstices and other categories can feed the conceptual lexicon of the different expressions of the interstitiality. This suggests a range of (sub)categories that specify the interstitial territory. The scale of analysis can influence this specificity and also the degree of 'emptiness', relationality and other aspects. In this vein, it is possible to compare and contrast different interstices within a larger interstitial space that can also suggest different understandings of the complex composition of the interstitial space itself.

### ***The interstitial infrastructure***

In a more general view, politically speaking how much interstitiality each city actually provides, what could be the consequence if they become urbanised, or what could be the global contribution if they become green infrastructure, for instance, are questions that can emerge for a more multi-national scope of research related to the impacts of urban sprawl and urbanisation in general. It opens agendas related to the global contribution

of different interstitialities as a matter of ‘interstitial infrastructure’ and their benefits as counterpoint to those related to urbanisation.

### **8.5 FUTURE AREAS OF RESEARCH**

Although this research deeply inspected the interstitial spaces of urban sprawl and disclosed their condition, character and implications in planning, due to the limitations and the scope of analysis there are several questions unanswered (or only partially answered) that open several lines of inquiry. Some of them are related to presented topics that can be deepened and new topics derived from the present research.

#### ***New categories of interstitiality***

Although the research discussed different functional categories of suburban interstices, different contexts can disclose unexplored expressions of interstitiality to improve the comprehension of the unbuilt geography of urban sprawl. Historical areas, for instance – that were not addressed in this research – can provide ‘archaeological interstices’ coexisting with suburban expansion. In a different vein, urbanised areas affected by war can describe interstices of peace (a ‘ceasefire interstice’) in which a truce can be made. Built-up structures and buildings in areas with larger land capacity can disclose the ‘aerial interstices’ useful to increase the density – indeed identified in Santiago. These different categories can expand the understanding of ‘interstitiality’ and open questions for planning beyond traditional bi-dimensional ‘land-use’ logics. It also supposes scrutinising differences on contextual configurations in which the interstices emerge.

#### ***Different modes of appropriation***

Although this research inspected the occupation and uses of interstices, the different modes of appropriation were not fully analysed. This would require a deeper understanding of how different groups occupy the space, where, when and why, and how it affects their relationality. These modes of appropriation can also open questions regarding how social organisations interact with institutional actors at different levels and the establishment of social rights in occupying interstices. As seen, important advances are done for Brighenti, (2013), Shaw and Hudson (2009) and Tonnelat (2008) but

they do not pay extra attention on the relational aspects of the metropolitan and regional scales of urban sprawl.

### *Changing surroundings' profile*

In this research, analysed interstices are all immersed in low-income communes. However, nothing has been empirically said about interstitiality in different socio-economic contexts. In this vein, a pending issue pertains to the inspection of how metropolitan and regional interstices operate in different socio-economic surroundings. There are some assumptions from social-based actors that in upper-class environments interstitial spaces must be better integrated and less marginal, which suggests that – apart from spatial, functional and institutional aspects – relationality can be conditioned by the socio-economic profile of surroundings. These considerations are also related to the institutional framework that operates in processes of suburbanisation in which suburban municipalities describe different financial performances to assume the integration of their interstitiality at local levels.

### *Closed environments*

Many interstitial spaces emerged as closed environments – such as military and industrial areas – in which the information, site visits, visual records, statistics, mapping and others are sensible to security norms or commercial restrictions. These spaces remained unexplored in the impacts of their different institutional aspects and how it affects their relational character and implications in suburban transformations.

### *Spatial aspects*

This thesis focused on the relational character of interstitial spaces but a more specific spatial analysis could be developed on the morphological aspects that influence suburban performance at different levels (Charmes and Keil, 2015), and that determine spatial aspects of permeability, links with infrastructure and strategies to integrate them using tools from architecture, spatial policy, urban and landscape design and related applied disciplines. At the moment, and based on the analysed cases, there are still

somehow unsuccessful strategies regarding the transformation of interstices and their integration with the suburban landscape.

### *Ecological contents*

Another aspect that can be deeply studied pertains to the ecological contents of interstitial spaces to provide data related to their bio-chemical and socio-environmental properties. Although these aspects were discussed, a more specific analysis can disclose specific ecological contents of the interstices to feed the planning agenda related to their transformation/preservation.

### *Institutional articulations*

A deeper understanding of the institutional superposition and actor's interactions placed on metropolitan and regional interstices can help to unveil the nodes of (dis)articulation that influence the (dis)integration of interstitial spaces. As seen, interstices are placed among different institutional representations, all of them with different attributions and interests that are not currently operating on articulated modes.

## **8.6 CONCLUSIONS**

Urban sprawl is matter of developed areas and interstitial spaces. Despite standard policies for promoting urban growth, interstitial spaces emerge as diverse and specific and so, each case deserves its own inspection. This feature of suburban sprawl was explained in terms of the origins of interstitiality which is not always a by-product of urban policies, although its intrinsic nature is highly determined by them. In this vein, the evolution of city-regions has defined an encounter between the production of (sub)urban space and interstitiality, which emerges as a different category of suburbanisation in which the degree of emptiness differs case by case and illustrates the transitional condition of interstices in the way of becoming built-up or simply forgotten lands.

These spaces are not spaces of consensus. They often emerge at and from the margins of regulations and as somehow unexpected outcomes of misaligned interests. They trigger differing positions regarding their nature but also illusions about their transformation. In this light, interstitial spaces

disclose a lack of control in a long-standing tradition in planning focused on the built-up realm and evince different degrees of spatial, political, economic and social resistance, instability in planning or at least, a different rhythm of transformation that also provides new insights about the intrinsic nature of the urban sprawl phenomenon.

## REFERENCES

- Adams, D., Russell, L. and Taylor-Russell, C. (1994) *Land for industrial development*. Spon, London
- Afla, M. and Reza, M. (2012, November) ‘Sustainability of urban cemeteries and the transformation of Malay burial practices in Kuala Lumpur metropolitan region’. In Proceedings of World Academy of Science, Engineering and Technology (No. 71, p. 538). World Academy of Science, Engineering and Technology (WASET)
- Ahaus, H. ‘Orders’, in Charles George Herbermann, et al. eds, *The Catholic Encyclopedia*, vol. 11 (NY: Universal Knowledge Foundation, 1913)
- Alvey, A. (2006) ‘Promoting and preserving biodiversity in the urban forest’. *Urban Forestry & Urban Greening*, 5 (4) 195–201
- Angotti, T. (2013) ‘Urban Latin America Violence, Enclaves, and Struggles for Land’. *Latin American Perspectives*, 40(2), 5-20
- Armijo, G. (2000) ‘La urbanización del campo metropolitano de Santiago: crisis y desaparición del hábitat rural’. *Revista de Urbanismo* N°3, 1 – 21
- Asociación Chilena de Empresas de Investigación de Mercado, AIM (2008) ‘Grupos Socioeconómicos’. Available at: [http://www.aimchile.cl/wp-content/uploads/2011/12/Grupos\\_Socioeconomicos\\_AIM-2008.pdf](http://www.aimchile.cl/wp-content/uploads/2011/12/Grupos_Socioeconomicos_AIM-2008.pdf). Visited in October 2015
- Augé, M. (1995) *Non-Places. Introduction to an Anthropology of Supermodernity*. Verso. London – New York
- Aurora, A. L., Simpson, T. R., Small, M. F., and Bender, K. C. (2009) ‘Toward increasing avian diversity: urban wildscapes programs’. *Urban ecosystems*, 12 (3), 347-358
- Aylwin, A. (1991) ‘Interrogantes y planteamientos sobre un gobierno metropolitano para Santiago de Chile’. *EURE*, 17(52), 143
- Bagaeen, S. (2006) ‘Redeveloping former military sites: Competitiveness, urban sustainability and public participation’. *Cities*, 23(5), 339-352
- Banerjee, A. Duflo, E. and Qian, N. (2012) ‘On the Road: Access to Transportation Infrastructure and Economic Growth in China. NBER Working Paper Series N° 17897. National Bureau of Economic Research. Cambridge, MA. 02-50

- Banzhaf, H. S. (2007) 'Public benefits of undeveloped lands on urban outskirts: Non-market valuation studies and their role in land use plans'. Andrew Young School of Policy Studies Research Paper Series, (07-28)
- Barbati, A., Corona, P., Salvati, L. and Gasparella, L. (2013) 'Natural forest expansion into suburban countryside: Gained ground for a green infrastructure?'. *Urban forestry & urban greening*, 12(1), 36-43
- Barhel, S., Parker, J. and Ernstson, H. (2015) 'Food and Green Space in Cities: A Resilience Lens on Gardens and Urban Environmental Movements'. *Urban Studies*. 52(7), 1321-1338
- Barkasi, A., Dadio, S., Losco, R., and Shuster, W. (2012) 'Urban Soils and Vacant Land As Stormwater Resources'. World Environmental and Water Resources Congress 2012. American Society of Civil Engineers. 569-579
- Barnes, K. B. Morgan III, J. Roberge, M. and Lowe, S. (2001) 'Sprawl development: its patterns, consequences, and measurement'. *Towson University, Towson*, 1-24.
- Barriball, K. and While, A. (1994) 'Collecting Data using a semi-structured interview: a discussion paper'. *Journal of advanced nursing*, 19(2), 328-335
- Barton, J. R., & Kopfmüller, J. (2012). Sustainable Urban Development in Santiago de Chile: background–concept–challenges. In *Risk Habitat Megacity* (pp. 65-86). Springer Berlin Heidelberg.
- Batten, D. (1995) 'Network Cities: Creative Urban Agglomerations for the 21st Century'. *Urban Studies* 32 (2) 313-327
- Bayón, M. and Saraví, G. (2013) 'The Cultural Dimensions of Urban Fragmentation Segregation, Sociability, and Inequality in Mexico City. *Latin American Perspectives* 40 (2) 35-52
- Becerril-Padua, M. (2000) 'Policentrismo en las ciudades latinoamericanas. El caso de Santiago de Chile'. *Revista THEOMAI* (1). Estudios sobre Sociedad, Naturaleza y Desarrollo / Society, Nature and Development Studies. Ponencia preparada para XXII Latin American Studies Association Congress 2000. Buenos Aires, Argentina
- Becker, D. M. (1966) 'Municipal Boundaries and Zoning: Controlling Regional Land Development'. *Wash. ULQ*, 1

- Bennet, G. and Mulongoy, KJ. (2006) 'Review of the experience with ecological networks, corridors and buffer zones'. Technical report n.23, Secretariat of the Convention on Biological Diversity, Montreal, Canada. Pp. 100
- Berger, A. (2007). *Drosscape: wasting land urban America*. Princeton Architectural Press
- Bert, W. (1999) 'Landscape fragmentation by urbanization in the Netherlands: options and ecological consequences'. *Journal of Environmental Sciences*. 11 (2) 141 – 148
- Bertrand, M., Figueroa, R. and Larrain, P. (1991) 'Renovación urbana en la Intercomuna de Santiago: Respuestas a la Ley 18.595 durante el periodo 1987-1990'. *Revista de Geografía Norte Grande*. 18: 27-36
- Boccardo, D. (2011) 'Tensions of a triple urban vocation: San Bernardo Bernardo and its absorption process from Santiago de Chile'. *Revista Territorios en Formación*. (2) 7-20
- Boisier, S. (2004) 'Desarrollo territorial y descentralización: El desarrollo en el lugar y en las manos de la gente'. *EURE (Santiago)*, 30 (90) 27-40
- Borsdorf, A. and Hidalgo, R. (2005) 'Los mega-diseños residenciales vallados en las periferias de las metrópolis latinoamericanas y el advenimiento de un nuevo concepto de ciudad. Alcances en base al caso de Santiago de Chile'. *Revista Electrónica de Geografía y Ciencias Sociales, SCRIPTA NOVA*, Universidad de Barcelona. 9(194) at: <http://www.ub.edu/geocrit/sn/sn-194-03.htm>
- Borsdorf, A., Hidalgo, R., and Sanchez, R. (2007) 'A new model of urban development in Latin America: the gated communities and fenced cities in the metropolitan areas of Santiago de Chile and Valparaíso'. *Cities*, 24(5), 365-378
- Bourque, M. (2000) 'Policy options for urban agriculture'. In *Growing cities, growing food: Urban agriculture on the policy agenda*. Feldafing, Germany. Pp. 119 – 145
- Bowler, D. Buyung-Ali, L. Knight, T. and Pullin, A. (2010) 'Urban Greening to cool towns and cities; a systemic review of the empirical evidence'. *Landscape and Urban Planning*. 97: 147 – 155

- Brain, I., and Sabatini, F. (2006) 'Los precios del suelo en alza carcomen el subsidio habitacional, contribuyendo al deterioro en la calidad y localización de la vivienda social'. *Revista PROURBANA*, 4, 2-13
- Brenner, N. and Elden S. (2009) 'Henri Lefebvre on State, Space, Territory'. *International Political Sociology* (2009) 3, 353–377
- Bresciani, L. (2010). 'Chile 27F 2010: La catástrofe de la falta de planificación'. *Revista EURE-Revista de Estudios Urbano Regionales*, 36(108), 151-153
- Brighenti, Andrea Mubi (2013) *Urban Interstices: The Aesthetics and the Politics of the In-between*. Ashgate. Surrey, England
- Brignardello, L. and Georgudis, B. (1997) 'Geopedología de la Cuenca de Santiago: Dimensión espacial de los problemas ambientales en los suelos'. *Revista de geografía Norte Grande*, 24: 127 – 141
- Browder, J., Bohland, J. and Scarpaci, L. (1995) 'Patterns of Development on the Metropolitan Fringe: Urban Fringe Expansion in Bangkok, Jakarta and Santiago'. *Journal of the American Planning Association*, 61(3)310-327
- Bruinsma, F. and Rietveld, P. (1993) 'Urban Agglomerations in European Infrastructure Networks'. Serie Research Memoranda. Faculteit der Economische Wetenschappen en Econometrie. Vrije Universiteit Amsterdam
- Bruinsma, F; Pepping, G. and Rietveld, P. (1993) 'Infrastructure and Urban Development; the case of the Amsterdam Orbital Motorway'. Serie Research Memoranda. Faculteit der Economische Wetenschappen en Econometrie. Vrije Universiteit Amsterdam
- Burawoy, M. (1991) 'The Extended Case Method'. In: *Ethnography Unbound. Power and Resistance in the Modern Metropolis*. University of California Press. Pp. 271-290
- Burger, M. and Meijers, E. (2012) 'Form Follows Function? Linking Morphological and Functional Polycentricity'. *Urban Studies*. 49 (5) 1127 – 1149
- Burgess, J; Harrison, C and Limb, M (1998) 'People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City'. *Urban Studies* 25 (1) 455- 473

- Cáceres, G. and Sabatini, F. (2002) 'Recuperación de plusvalías: reflexiones sobre su posible aplicación en las Ciudades chilenas'. *URBANO*, 5(6) 56-61
- Calthorpe, P. and Fulton, W. (2001) *The Regional City*. Island Press. Washington. Covelo. London
- Camagni, R., Gibelli, M. C., and Rigamonti, P. (2002) 'Urban mobility and urban form: the social and environmental costs of different patterns of urban expansion'. *Ecological Economics*, 40(2), 199-216
- Cámara Chilena de la Construcción, C.Ch.C. (2012) 'Disponibilidad de suelo en el gran Santiago. Resultados Estudio 2012, Evolución 2007-2012'
- Cariola, C. and Lacabana, M. (2001) 'La Metropolis Fragmentada: Caracas entre la pobreza y la globalización'. *EURE* 27 (80) 9-32
- Caspersen, O. Konijnendijk, C. and Olafsson, A. (2006) 'Green Space Planning and Land Use: An Assessment of Urban Regional and Green Structure Planning in Greater Copenhagen'. *Danish Journal of Geography* 106 (2) 7-20
- Castillo, J.C. (2011) 'Is Inequality Becoming Just? Changes in Public Opinion anout Economic Distribution in Chile'. *Bulletin of Latin American Research. Journal of the Society for Latin American Studies*. 31(1), 1-18
- Castro, C. (2005) 'Impacto de la dispersión urbana de la ciudad de Santiago en la calidad del suelo en la periferia Norte: Colina y Lampa'. *Revista Electrónica de Geografía y Ciencias Sociales, SCRIPTA NOVA*, Universidad de Barcelona. 9(194). In: <http://www.ub.edu/geocrit/sn/sn-194-37.htm>
- Catalán, J., Fernandez, J. and Olea, J. (2013) *Cultivando Historia. Trayectorias, Problemáticas y Proyecciones de los Huertos de La Pintana*. Ed. Dhiyo. Santiago, Chile
- Cervero, R. (2003) 'Road Expansion, Urban Growth, and Induced Travel: A Path Analysis'. *Journal of the American Planning Association*. 69 (2) 145-163
- Charmes, E. and Keil, R. (2015) 'The Politics of Post-Suburban Densification in Canada and France'. *International Journal of Urban and Regional Research, IJURR*. 39(3), 581-602

- Chatzidimitriou, A. and Yannas, S. (2015) 'Microclimate development in open urban spaces: the influence of form and materials'. *Energy and Buildings*, 108, 156-174
- Chellew, P., Escudero, J., & Seelenberger, S. (1973). Planificación y gobierno para el Área Metropolitana de Santiago: algunas alternativas. *Revista EURE-Revista de Estudios Urbano Regionales*, 3(8) 99-119
- Chiesura, A. (2004) 'The role of urban parks for the sustainable city'. *Landscape in urban planning*. 68 (1) 129 – 138
- Chiesurahico, A. (2004) 'The role of urban parks for the sustainable city'. *Landscape and Urban Planning*. 68 (1) 129–138
- Chuaqui, T. and Valdivieso, P. (2004) 'Una ciudad en busca de un gobierno: Una propuesta para Santiago. *Revista de ciencia política (Santiago)*, 24(1) 104-127
- Clawson, M. (1962) 'Urban Sprawl and Speculation in Suburban Land'. *Land Economics*. 38 (2) 99-111
- Club Universidad de Chile. Available at: <http://www.udechile.cl/>. Visited in October 2015
- Coley, R.; Sullivan, W. and Kuo, F. (1997) 'Where Does Community Grow? The Social Context Created by Nature in Urban Public Housing'. *Environment and Behavior*. 29:468-494
- Collier, J. and Collier, M. (1986) *Visual anthropology: Photography as a research method*. UNM Press, Mexico
- Collier, P. and Venables, A. (2016) 'Urban infrastructure for development'. *Oxford Review of Economic Policy*, 32(3), 391-409
- Collins English Dictionary – Complete and Unabridged © HarperCollins Publishers 1991, 1994, 1998, 2000, 2003
- Contreras, D. (1996) 'Pobreza y desigualdad en Chile: 1987-1992. Discurso, metodología y evidencia empírica'. *Estudios Públicos*, 64, 57- 94
- Contreras, D. (1999) 'Distribución del ingreso en Chile. Nueve hechos y algunos mitos'. *Perspectivas*, 2 (2) 311-332
- Contrucci, P. (2012) 'La Competencia desleal del PRMS100'. Entrevista a Pablo Contrucci, Director Nacional de Desarrollo Urbano, MINVU. *Revista Planeo N°7, Políticas e Instrumentos*. Available at: <http://revistaplano.uc.cl/2012/09/01/la-competencia-desleal-del-prms-100/>

- Cooper, M. and Henríquez, C. (2010) 'Planificación territorial y crecimiento urbano: desarticulaciones de la sostenibilidad urbano-regionales en Santiago Metropolitano'. *Revista Electrónica de Geografía y Ciencias Sociales, SCRIPTA NOVA*, Universidad de Barcelona. 14(331) at: <http://www.ub.edu/geocrit/sn/sn-331/sn-331-14.htm>
- Coy, M. and Pöhler, M. (2002) 'Gated communities in Latin American megacities: case studies in Brazil and Argentina'. *Environment and Planning B: Planning and design*, 29(3), 355-370
- Cummins, S. and Macintyre, S. (2002) 'A systematic study of an urban foodscape: the price and availability of food in greater Glasgow'. *Urban Studies*, 39(11)2115-130
- Da Costa Braga, A. and Rigatti, D. (2009) 'International Conurbations along Brazil – Uruguay Border on Ambiguity Drives Spatial Patterns and Social Exchange. Proceedings of the 7<sup>th</sup> International Space Syntax Symposium. Edited by Daniel Koch, Lars Marcus and Jesper Steen. Stockholm: KTH, 2009. Ref 022
- Da Costa Braga, A. C., Rigatti, D., Ugalde, C. M., and Zampieri, F. (2012) 'Frontier conurbations: rather than twin cities, a symbiotic outcome of two national cultures and identities'. In *Proceedings: Eighth International Space Syntax Symposium*
- Dammert, L. (2004) '¿Ciudad sin ciudadanos? Fragmentación, segregación y temor en Santiago'. *EURE* 30 (91) 87-96
- Daniel, T., Muhar, A., Arnberger, A., Aznar, O., Boyd, J. W., Chan, K. M. and Grêt-Regamey, A. (2012) 'Contributions of cultural services to the ecosystem services agenda'. *Proceedings of the National Academy of Sciences*, 109(23), 8812-8819
- Davies, M. (2011) 'Concept mapping, mind mapping and argument mapping: what are the differences and do they matter?'. *Higher education*, 62(3), 279-301
- De la Puente, P., Torres, E. and Muñoz, P. (1990) 'Satisfacción residencial en soluciones habitacionales de radicación y erradicación para sectores pobres de Santiago'. *EURE*, 16(49)7-22
- De Mattos, C. (1999) 'Santiago de Chile, globalización y expansión metropolitana: lo que existía sigue existiendo'. *EURE*, 225 (76) 29-56

- De Mattos, C. (2001) 'Metropolización y suburbanización'. EURE (Santiago). 27(80) 5-8
- De Mattos, C. (2002) 'Mercado metropolitano de trabajo y desigualdades sociales en el Gran Santiago: ¿Una ciudad dual?'. EURE, 28 (85) 51-70
- De Mattos, C. (2002) 'Transformación de las ciudades Latinoamericanas. ¿Impactos de la globalización?' EURE 28 (85) 05-10
- De Mattos, C. (2004) 'Santiago de Chile: Metamorfosis bajo un nuevo impulse de modernización capitalista'. In *Santiago en la globalización: ¿Una nueva ciudad?* Ed. Sur – EURE, 2004. Santiago. Chile
- De Mattos, C. A. (1996) 'Avances de la globalización y nueva dinámica metropolitana: Santiago de Chile, 1975-1995'. EURE, 22(65) 39-63
- De Mattos, C., Fuentes, L. and Link, F. (2014), 'Tendencias recientes del crecimiento metropolitano en Santiago de Chile. ¿Hacia una nueva geografía urbana?' ['Recent metropolitan growth trends in Santiago de Chile. Towards a new urban geography?'], INVI, **29**, 193-219
- De Ramón, A. (1009) 'La población informal. Poblamiento de la periferia de Santiago de Chile, 192'-1970'. EURE, 17 (50) 5-17
- De Solá-Morales, I. (2002) *Territorios*. Editorial Gustavo Gili. S.A. Barcelona.
- De Soto, H., Moya M., Max-Neff, M., Larroulet, C. and Tokman, V. (1988) 'Sector Informal, Economía Popular y Mercados Abiertos'. Centro de Estudios Públicos CEP. Pp. 1-25
- De Zeeuw, H., Gündel, S. and Waibel, H. (2000) 'The integration of agriculture in urban policies'. In *Growing cities, growing food: Urban agriculture on the policy agenda*. Feldafing, Germany. Pp. 161 – 180
- Del Piano, A., 2010. *Memoria explicativa, Ciudad Parque Bicentenario – Una nueva forma de hacer ciudad*. Ministerio de Vivienda y urbanismo, Gobierno de Chile. Santiago
- Delgado, C. (2015) 'Answer to the Portuguese Crisis: Turning Vacant Land into Urban Agriculture'. *Cities and the Environment (CATE)*, 8(2), 5
- Delgado, O. B., Mendoza, M., Granados, E. L., and Geneletti, D. (2008) 'Analysis of land suitability for the siting of inter-municipal landfills

- in the Cuitzeo Lake Basin, Mexico'. *Waste Management*, 28(7), 1137-1146
- Der Krabben, E. V. and Needham, B. (2008) 'Land readjustment for value capturing: a new planning tool for urban redevelopment'. *Town Planning Review*, 79(6), 651-672
- Diener, E. (1984) 'Subjective Well-Being'. *Psychological Bulletin* 95 (3) 542 – 575
- Dorland's Medical Dictionary. Available at: [http://web.archive.org/web/20090603032850/http://www.mercksource.com/pp/us/cns/cns\\_hl\\_dorlands\\_split.jsp?pg=/ppdocs/us/common/dorlands/dorland/three/000041013.htm](http://web.archive.org/web/20090603032850/http://www.mercksource.com/pp/us/cns/cns_hl_dorlands_split.jsp?pg=/ppdocs/us/common/dorlands/dorland/three/000041013.htm). Visited in September 2015
- Douglas, I (2008) 'Environmental Change in Peri-Urban Areas and Human and Ecosystem Health'. *Geography Compass* 2 (4) 1095–1137
- Dovey, K. (2012) 'Informal urbanism and complex adaptive assemblage'. *International Development Planning Review*. 34 (4), 349-367
- Dovey, K. and King, R. (2012) 'Informal urbanism and the taste for slums'. *Tourism Geographies*, 14 (2), 275-293
- Drake, P. (2003) 'El movimiento obrero en Chile: De la Unidad Popular a la Concertación'. *Revista de Ciencia Política*. 23(2)148-158
- Ducci, M. (1997) 'Chile: el lado oscuro de una política de vivienda exitosa'. *EURE*, 23 (69) 99-115
- Ducci, M. (1997) 'Chile: el lado oscuro de una política de vivienda exitosa'. *EURE*, 23 (69) 99-115
- Ducci, M. (1998) 'Santiago, ¿una mancha de aceite sin fin?, ¿Qué pasa con la población cuando la ciudad crece indiscriminadamente? *EURE* (Santiago), 24 (72), 85-94
- Ducci, M. (2002). Área urbana de Santiago 1991-2000: expansión de la industria y la vivienda. *EURE (Santiago)*, 28(85), 187-207
- Ducci, M. and Gonzalez, M. (2006), 'Anatomía de la expansión de Santiago, 1991-2000' ['Anatomy of the Santiago's expansión, 1991-2000'], in A. Galetovic (ed), *Santiago: Dónde estamos y hacia dónde vamos*, [*Santiago: where we are and where we go*], Santiago, Chile, Centro de Estudios Públicos, 123-46

- Echeñique, M., 2006. El crecimiento y el desarrollo de las ciudades. In *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 73-96. Centro de Estudios Públicos, 2006. Santiago, Chile
- Eckbo, G. (2015) 'Is landscape architecture? In: *Is Landscape...? Essays on the Identity of Landscap*. Doherty, G. and Waldheim, C. (Eds.) (2015). Routledge, NY
- Ekers, M., Hamel, P., and Keil, R. (2012) 'Governing suburbia: modalities and mechanisms of suburban governance'. *Regional Studies*, 46(3), 405-422
- Eliash, H., 2006. Portal Bicentenario: breve crónica de un Proyecto emblemático. *Revista de Arquitectura, Universidad de Chile*. 13, 56-58
- EMB Construcción Magazine. Interview with Arturo Lyon. Proyecto Sur: Una respuesta diferente frente al crecimiento urbano [South Project: A different response to face the urban growth]. Edition September 2016 (Available at: <http://www.emb.cl/construccion/articulo.mvc?xid=1814&edi=81&tip=&act=&srch=&rand=4216X2229&cmtok=x#cmt>)
- Engel, E. and Galetovic, A. (2014) 'Urban transport: can public-private partnerships work?'. *World Bank Policy Research Working Paper*, (6873)
- Ernstson, H., Barthel, S., Andersson, E. and Borgström, S. (2010) 'Scale-crossing brokers and network governance of urban ecosystem services: the case of Stockholm'. *Ecology and Society*, 15(4), 28
- Escobar, L. (2006) 'Indicadores sintéticos de calidad ambiental: un modelo general para grandes zonas urbanas' *EURE*. 32 (96) 73-98
- Escolano, S. and Ortiz, J. (2005) 'La formación de un modelo policéntrico de la actividad comercial en el Gran Santiago (Chile). *Revista de Geografía Norte Grande*. 34, 53-64
- Espeseth, R. and Cassens, K. (1996) 'Greenways. Those long, skinny, green parks. *Illinois Parks and Recreation*'. 27: 35 – 36
- Etxezarreta, A. and Merino, S. (2013) 'Las cooperativas de vivienda como alternativa al problema de la vivienda en la actual crisis económica'. *REVESCO. Revista de Estudios Cooperativos*. 113, 92 – 119

- Evans, A. (2006) 'Planificación, cinturones verdes y límites al crecimiento urbano'. In *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 179-203. Centro de Estudios Públicos, 2006. Santiago, Chile
- Ewing, R. Pendall, R. and Chen, D. (2002) 'Measuring Sprawl and its Impact'. Volume 1. SG America. P. 1-55
- Faludi, A. (2005) 'The Netherlands: A Country With A Soft Spot for Planning'. *Comparative Planning Cultures*, Routledge, Vienna
- Faludi, A.; Van Der Valk, A and Lörzing, H. (1996) 'The Green Heart Debate'. *Tijdschrift voor Economische en Sociale Geografie*. 87 (5) 448 – 457
- FAO. (1996) 'Urban agriculture: an oxímoron? What is urban agriculture? In: The state of food and agriculture. World Review, III. Selected issues. 1996 (Rome: FAO). 43 – 57
- Fazal, S., Geertman, S. C. and Toppen, F. J. (2012) 'Interpretation of Trends in Land Transformations-A Case of Green Heart Region (The Netherlands)'. *Natural Resources*, 3(3), 107-117
- Fernández, A. and Vera, M. (2102) 'The Bachelet Presidency and the End of Chile's Concertation Era'. *Latin American Perspectives*. 185(39) 5-18
- Ferrando, F. (2008). Santiago de Chile: antecedentes demográficos, expansión urbana y conflictos. *Revista de Urbanismo*, (18)
- Figueroa, J. (2009) 'Las leyes del suelo. A propósito de la propuesta de modificación y actualización del PRM 1994 de Santiago'. *Revista URBANO* 19, 28 – 42
- Figueroa, O., and Orellana, A. (2007) 'Transantiago: gobernabilidad e institucionalidad'. *EURE*, 33(100), 165-171
- Fleischhauer, J. Lehmann, L. and Kléber, A. (1995) 'Electrical resistances of interstitial and microvascular space as determinants of the extracellular electrical field and velocity of propagation in ventricular myocardium'. *Circulation* 92 (3) 587–94
- Flyvbjerg, B. (2006) 'Five Misunderstandings About Case-Study Research'. *Qualitative Inquiry*, 12 (2) 219-245
- Fontaine, J. (1993) 'Transición Económica y Política en Chile: 1970-1990). *Estudios Públicos*, 50: 229-279

- Foo, K., Martin, D., Wool, C. and Polsky, C. (2013) 'The production of urban vacant land: Relational placemaking in Boston, MA neighborhoods'. *Cities*, 35, 156-163
- Fors, H., Molin, J. F., Murphy, M. A., & van den Bosch, C. K. (2015). User participation in urban green spaces—For the people or the parks?. *Urban Forestry & Urban Greening*, 14(3), 722-734
- Frantál, B., Greer-Wootten, B., Klusáček, P., Krejčí, T., Kunc, J., and Martinát, S. (2015) 'Exploring spatial patterns of urban brownfields regeneration: The case of Brno, Czech Republic'. *Cities*, 44, 9-18
- Friedmann, J. and Necochea, A. (2014) 'Algunos problemas de política de urbanización de la Región Capital de Chile'. *EURE*, 1(1), 63 – 95
- Fuentes, L. and Sierralta, C. (2004) 'Santiago de Chile, ¿ejemplo de una reestructuración capitalista global?'. *EURE*. 30 (91) 7-28
- Fundación Un Techo para Chile. Documento de trabajo N3, Centro de Investigación Social, Noviembre 2009. Eds. Francisca Bustamente and María Paz Sagredo, Santiago 2009
- Gabriel, N., "No place for wilderness": Urban parks and the assembling of neoliberal urban environmental governance. *Urban Forestry & Urban Greening* (2016), (article in press)
- Gainza, X. and Livert, F. (2013) 'Urban form and the environmental impact of commuting in a segregated city, Santiago de Chile'. *Environment and Planning B: Planning and Design* 40(3) 507 – 522
- Galetovic, A. and Jordan, P. (2006) 'Santiago: Dónde estamos y hacia dónde vamos?'. In *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 25-69. Centro de Estudios Públicos, CEP, 2006. Santiago, Chile
- Galilea, S. (2006) 'Proyecto Portal Bicentenario'. *Revista de Arquitectura*, Universidad de Chile. N°13, 58-61
- Galilea, S., and Hurtado, J. (2014) 'Efectos del Metro en la estructura urbana de Santiago'. *EURE*. 14(42) 43-62
- Galland, D. and Enemark, S. (2012) 'The Danish National Spatial Planning Framework'. *Planning for States and Nation/States: A Transatlantic Exploration*. UCD Newman House, St Stephen's Green, Dublín 2

- Gallent, N. and Shaw, D. (2007) 'Spatial Planning, Area Action Plans and the Rural-Urban Fringe'. *Journal of Environmental Planning and Management* 50 (05) 617-638
- Galletta, A. (2013) *Mastering the semi-structured interview and beyond: From research design to analysis and publication*. NYU Press
- Galster, G; Hanson, R; Ratcliffe, M; Wolman, H; Coleman and Freihage (2001) 'Wrestling Sprawl to the Ground: Defining and Measuring an Elusive Concept'. *Housing Policy Debate* 12 (4) 681-717
- Gandy, M. (2011) 'Interstitial landscapes: reflections on a Berlin corner'. In Gandy, M. (ed.) *Urban constellations* (Berlin: jovis, 2011) pp. 149-152
- Gandy, M. (2013) 'Marginalia: Aesthetics, ecology, and urban wastelands'. *Annals of the Association of American Geographers*, 103 (6), 1301-1316
- Garretón, M. (1982) 'Modelo y proyecto político del régimen militar chileno'. *Revista Mexicana de Sociología*. 4(2) 355-372
- Geist, V. (2004) 'Big game in the city: the other side of the coin'. In: *Proceedings of the 4<sup>th</sup> International Symposium on urban wildlife conservation*. University of Arizona, Tucson, July 2004
- Gillham, O. (2002) 'What is Sprawl?'. *The Limitless City. A Primer on the Urban Sprawl Debate*. ISLAND PRESS. The US
- Gilly, J.P. and Wallet, F. (2001) 'Forms of proximity, Local Governance and the Dynamics of Local Economic Spaces: The Case of Industrial Conversion Processes'. *International Journal of Urban and Regional Research*. 25 (3) 553 – 570
- Giraldo, F. (1997) 'La vivienda en un modelo alternativo'. In *Las reformas sociales en acción: vivienda*. Serie Políticas Sociales, 20. CEPAL, LC/L. 1057: 17-27
- Girling, C. (2010) 'Smart Growth meets low impact development: a case study of UniverCity, Vancouver, Canada'. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability* 03 (01) 69-93
- Gobster, P. (2012) 'Appreciating urban wildscapes'. Pp. 33-48. In *Urban wildscapes*. Routledge. London and NY

- Graham, S. (2000) 'Constructing Premium Network Spaces: Reflections on Infrastructure, Networks and Contemporary Urban Development'. *International Journal of Urban and Regional Research*, 24 (1) 183-200
- Graham, S. and Marvin, S. (2001) *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. Psychology Press, NY
- Gravsholt Busk, A. Kristensen, S. Praestholm, S. Reenberg, A and Primdahl, J. (2006) 'Land System Changes in the context of urbanization: Examples from the Peri-Urban Area of Greater Copenhagen'. *Danish Journal of Geography* 106 (2) 21-34
- Green, O., Garmestani, A., Albro, S., Ban, N., Berland, A., Burkman, C. and Shuster, W. D. (2016) 'Adaptive governance to promote ecosystem services in urban green spaces'. *Urban Ecosystems*, 19(1), 77-93
- Grim, N. Foster, D. Groffman, P. Grove, J. Hopkinson, C. Nadelhoffer, K. and Peters, D. (2008) 'The changing landscape: ecosystem responses to urbanization and pollution across climatic and societal gradients. *Frontiers in Ecology and the Environment*'. 6 (1) 264 – 272
- Gross, P. (1991) 'Santiago de Chile (1925-1990): Planificación urbana y modelos políticos'. *EURE* 17 (52/53) 27-52
- Gruby, R. and Basurto, X (2013) 'Multi-level governance for large marine commons: Politics and polycentricity in Palau's protected area network'. *Environmental Science & Policy*. 33 (1) 260 - 272
- Gunnar, P. and Inger-Lise, S. (2011) 'Minicities in suburbia. A model for urban sustainability?'. *FORMakademisk*. 4 (2) 38- 58
- Gurovich, A. (1999) 'Una ciudad interminable: La Pintana'. *Revista de Urbanismo, Universidad de Chile*. 1 (1) 01-10
- Gurovich, A. (2003) 'Conjugando los tiempos del verbo idealizar: los huertos obreros y familiares de La Pintana, Santiago de Chile. *Cuadernos del CENDES*.53(53)59-70
- Gutiérrez, F. (1985) 'Dismunución de la superficie agrícola en el Gran Santiago'. *Ambiente y Desarrollo*. 1 (2) 131 – 135
- Gutiérrez, J. C. (2014). Análisis y planificación de zonas inundables. Estudio de caso: Quebrada y Canal de Ramón, Santiago de Chile. *Geographicalia*, (66), 21-44.

- Haaland, C. and Van Den Bosch, C. (2015) 'Challenges and strategies for urban green-space planning in cities undergoing densification: A review'. *Urban Forestry & Urban Greening*, 14(4), 760-771
- Hamers, D. and Piek, M. (2012) 'Mapping the future urbanization patterns on the urban fringe in the Netherlands'. *Urban research & Practice*. 5 (1) 129-156
- Hamilton, C. and Kellett, J. (2016) 'Exploring infrastructure provision issues in greenfield and urban infill residential developments'. *State of Australian Cities Conference 2015*. QT, Gold Coast, Queensland, Australia
- Haramoto, E., Jadue, D. and Tapia, R. (1997) 'Programa de Viviendas Básicas en la Región Metropolitana 1990-1995: Un análisis crítico desde una perspectiva global'. *Boletín INVI N°44*. 16:77-87
- Hardon, J. (2007) *Modern Catholic Dictionary*. Trinity Publications, 2007
- Harvey, T. and Works, M. (2002) 'Urban Sprawl and Rural Landscapes: Perceptions of landscape as amenity in Portland, Oregon'. *Local Environment: The International Journal of Justice and Sustainability*. 7 (4) 381-396
- Hebbert, M. (1986) 'Urban Sprawl and Urban Planning in Japan'. *The Town Planning Review*. 57 (2) 141-158
- Heinrichs, D. Nuissl, H. and Rodriguez, C. (2009) 'Dispersión urbana y nuevos desafíos para la gobernanza (metropolitana) en América Latina: el caso de Santiago de Chile'. *EURE* 35 (104) 29-46
- Heinrichs, D.; Lukas, M.; Nuissl, H. (2011). 'Privatisation of the fringes – a Latin American version of post-suburbia? The case of Santiago de Chile', In: Phelps, N.; Wu, F. (eds.): *International Perspectives on Suburbanization: A Post-Suburban World?* P. 101-121. (Eds) Houndmills, Basingstoke: Palgrave Macmillan, 2011
- Hess, G. Daley, S. Dennison, B. Lubkin, S. McGuinn, R. Morin, V. Potter, K. Savage, R. Shelton, W. Snow, C. and Wrege, B. (2001) 'Just What is Sprawl, Anyway?'. *Carolina Planning*. 26 (2) 11-26
- Heynen, N., Kaika, M., and Swyngedouw, E. (2006) 'Urban political ecology'. In: *The nature of cities: Urban political ecology and the politics of urban metabolism* (Heynen, Kaika and Swyngedouw Eds.). Pp. 1-20

- Hidalgo, R. (2004) 'La vivienda social en Santiago de Chile en la segunda mitad del siglo XX: Actores relevantes y tendencias espaciales. ¿Una nueva ciudad? In *Santiago en la globalización: ¿una nueva ciudad?* Ediciones SUR/EURE, Santiago, Chile
- Hidalgo, R. (2007) '¿Se acabó el suelo en la gran ciudad? Las nuevas periferias metropolitanas de la vivienda social en Santiago de Chile'. EURE. 33 (98) 57-75
- Hidalgo, R., Salazar, A., Lazcano, R., Roa, F., Álvarez, L. and Calderón, M. (2005) 'Transformaciones socioterritoriales asociadas a proyectos residenciales de condominios en comunas de la periferia del área metropolitana de Santiago'. Revista INVI, 20(54) 104-133
- Holcombe, R. (1999) 'In Defense of Urban Sprawl. Enhancing the Quality of Life'. *Urban Sprawl: Pro and Con*. PERC REPORTS, 17 (1) 1-20
- Home, R; Bauer, N. and Hunziker, M. (2010) 'Cultural and Biological Determinants in the Evaluation of Urban Green Spaces' *Environment and Behavior* 42(4) 494-523
- Hovinen, G. (1977) 'Leapfrog Developments in Lancaster County: A Study of Residents' Perceptions and Attitudes'. *The Professional Geographers*. 29(2) 194-199
- Hsieh, H. F. and Shannon, S. E. (2005) 'Three approaches to qualitative content analysis'. *Qualitative health research*, 15 (9), 1277-1288
- Ige, J.O and Atanda, T.A (2013) 'Urban Vacant Land and Spatial Chaos in Ogbomoso North Local Government, Oyo State, Nigeria'. *Global Journal of Human Social Science & Environmental Science & Disaster Management*. 13 (2) 28 – 36
- Ingram, G. (2006) 'Patrones de desarrollo metropolitano'. 97-122. Chapter 4. *Santiago, donde estamos y hacia dónde vamos?* Galetovic Alexnader. Centro de Estudios Públicos. Santiago de Chile
- Inostroza, L.; Baur, R. and Csaplovics, E. (2013) 'Urban sprawl and fragmentation in Latin America: A dynamic quantification and characterization of spatial patterns'. *Journal of Environmental Management*. (115) 87-97
- Instituto Libertad y Desarrollo, 2004. ¿Estado Empresario? Casos Cerrillos y ENAP Perú. *Temas Públicos*, N°689. Instituto Libertad y Desarrollo. Santiago, Chile

- Instituto Nacional de Estadísticas, INE (2002). Available at: <http://www.ine.cl/> (visited in October 2015)
- Instituto Nacional de Estadísticas, INE (2005) 'Metropolitan Region of Santiago'. In: *Chile: Cities, towns, villages and hamlets* (Pp. 269 – 297)
- Inzulza, J. and Galleguillos, X. (2014), 'Latino gentrificación y polarización: transformaciones socioespaciales en barrios pericentrales y periféricos de Santiago, Chile' ['Latino gentrification and polarisation: socio-spatial transformations in peripheral and peri-central neighbourhoods, Santiago, Chile'], *Revista de geografía Norte Grande*, 58, 135-59
- Iossifova, D. (2013) 'Searching for common ground: Urban borderlands in a world of borders and boundaries'. *Cities*, 34, 1-5
- Irarrázaval, F. (2012) 'El imaginario "verde" y el verde urbano como instrumento de consumo inmobiliario: configurando las condiciones ambientales del área metropolitana de Santiago'. *Revista INVI*, 75 (27) 73-103
- Irwin, E. and Bockstael, N. (2007) 'The evolution of urban sprawl: Evidence of spatial heterogeneity and increasing land fragmentation'. *Proceedings of the National Academy of Sciences of the United States of America*. 104 (52) 20672 - 20677
- James, P., Tzoulas, K., Adams, M. D., Barber, A., Box, J., Breuste, J. and Handley, J. (2009) 'Towards an integrated understanding of green space in the European built environment' *Urban Forestry and Urban Greening* (8) 65-75
- Janoschka, M. (2002) 'El nuevo modelo de la ciudad Latinoamericana: Fragmentación y privatización'. *EURE* 28 (85) 11-29
- Jansen, E. (2002) *NetLingo. The Internet Dictionary*. NetLingo Inc. p.206. Canada
- Jaret, C. Ghadge, R. Williams Reid, L. and Adelman, R. (2009) 'The Measurement of Suburban Sprawl: An Evaluation'. *City & Community* 8 (1) 65 – 84
- Jirón, L. and Mawromatis, C. (1999) 'Urban form at the fringe of Metropolitan Santiago (Chile). A result of a normative or profitability plan?'. *Revista de Urbanismo*. 01: 1-13

- Jirón, P., and Mansilla, P. (2013) 'Atravesando la espesura de la ciudad: vida cotidiana y barreras de accesibilidad de los habitantes de la periferia urbana de Santiago de Chile'. *Revista de Geografía Norte Grande*, (56), 53-74
- Johnson, A. L. (2015) 'The ecology of urban vacant lands: Human-mediated local versus regional control on plant community assembly' (Doctoral dissertation, university of Maryland, Baltimore county)
- Johnson, B. and Shneiderman, B. (1991) 'Tree-maps: A space-filling approach to the visualization of hierarchical information structures, in Proceedings of IEEE Visualization (VIS)'. 284–291
- Jorgensen, A. and Keenan, R. (2012) *Urban Wildscapes*. Routledge, London, UK
- Jorgensen, A., and Tylecote, M. (2007) 'Ambivalent landscapes—wilderness in the urban interstices'. *Landscape Research*, 32(4), 443-462.
- Kabisch, N. (2015) 'Ecosystem service implementation and governance challenges in urban green space planning—The case of Berlin, Germany'. *Land Use Policy*, 42, 557-567
- Kaissling, B. Hegyi, I. Loffing, J. and Le Hir, M. (1996) 'Morphology of interstitial cells in the healthy kidney' *Anat. Embryol.* 193 (4) 303–18
- Kassa, F. (2013) 'Conurbation and Urban Sprawl in Africa: The case of the City of Addis Ababa. *Ghana Journal of Geography.* 5, 73 – 89
- Keil, R and Young, D. (2011) 'Introduction: In-Between Canada. The Emergence of the New Urban Middle' (01-18) *In-Between Infrastructure: Urban Connectivity in an Age of Vulnerability*. Editors: Douglas Young, Patricia Wood, Roger Keil. ISBN 978-0-9865387-5-9
- Kim, G. (2016) 'Assessing Urban Forest Structure, Ecosystem Services, and Economic Benefits on Vacant Land'. *Sustainability*, 8(7), 679
- Kim, G., Miller, P. A. and Nowak, D. J. (2015) 'Assessing urban vacant land ecosystem services: Urban vacant land as green infrastructure in the City of Roanoke, Virginia'. *Urban Forestry & Urban Greening*, 14(3), 519-526
- Kitha, J. and Lyth, A. (2011) 'Urban wildscapes and green spaces in Mombasa and their potential contribution to climate change adaptation and mitigation'. *Environment and Urbanization*, 23 (1), 251-265

- Kloosterman, R. and Lambregts, B. (2001) Clustering of Economic Activities in Polycentric Urban Regions: The Case of the Randstad. *Urban Studies* 38 (4) 717 – 732
- Knott, K. (2016) ‘Walls and other unremarkable boundaries in South London: impenetrable infrastructure or portals of time, space and cultural difference?’. *New Diversities*, 17(2), 15-34
- Kombe, W. J. (2005). Land use dynamics in peri-urban areas and their implications on the urban growth and form: the case of Dar es Salaam, Tanzania. *Habitat International*, 29(1), 113-135
- Koohsari, M., Mavoja, S., Villanueva, K., Sugiyama, T., Badland, H., Kaczynski, A. T. and Giles-Corti, B. (2015) ‘Public open space, physical activity, urban design and public health: Concepts, methods and research agenda’. *Health & place*, 33, 75-82
- Korff, V., Oberg, A. and Powell, W. (2015) ‘Interstitial organizations as conversational bridges’. *Bulletin of the American Society for Information Science and Technology*, 41(2), 34-38
- Kraas, F. and Mertins, G. (2014) ‘Megacities and global change’. In *Megacities* (pp. 1-6). Springer Netherlands
- Kremer, P. and Hamstead, Z. (2015) ‘Transformation of urban vacant lots for the common good: an introduction to the special issue’. *Cities and the Environment (CATE)*, 8(2), 1
- Kremer, P., Hamstead, Z. A., and McPhearson, T. (2013) ‘A social-ecological assessment of vacant lots in New York City’. *Landscape and Urban Planning*, 120, 218-233
- Kühn, Manfred (2003) ‘Greenbelt and Green Heart: separating and integrating landscapes in European city regions’. *Landscape and Urban Planning*, 64 (1–2) 19–27
- Kurz, T. and Baudains, C. (2010) ‘Biodiversity in the Front Yard: An Investigation of Landscape Preference in a Domestic Urban Context’. *Environment and Behavior*. 44 (2) 166-196
- Kusnetzoff, F. (1987) ‘Urban and Housing policies under Chile’s Military Dictatorship, 1973-1985’. *Latin American Perspectives*. 14(2) 157-186
- La Greca, P; La Rosa, D; Martinico, F. and Privitera, R. (2011) ‘Agricultural and Green infrastructures: The role of non-urbanized

- areas for eco-sustainable planning in metropolitan region'. *Environmental Pollution* 159 (01) 2193-2202
- La Rosa, D. and Privitera, R. (2013) 'Characterization of non-urbanized areas for land-use planning of agricultural and green infrastructure in urban contexts'. *Landscape and Urban Planning* 109 (01) 94-106
- La Tercera. González, C. and Fuenzalida, R. (20 de agosto de 2011). La Tercera, ed. 'La U. alista su casa en La Pintana'. Available at: <http://diario.latercera.com/2011/08/20/01/contenido/deportes/4-80851-9-la-u-alista-su-casa-en-la-pintana.shtml>. Visited in October 2015
- La Tercera. Parker, M. (13 December 2014). La Tercera, ed. 'El sueño azul toma forma: Así será el anhelado estadio de la Universidad de Chile'. Available at: <http://www.latercera.com/noticia/deportes/2014/12/656-608480-9-el-sueno-azul-toma-forma-asi-sera-el-anhelado-estadio-de-la-universidad-de-chile.shtml>. Visited in October 2015
- La Tercera: 'Barristas de Colo Colo y la U. de Chile protagonizan desmanes tras prácticas para Superclásico' (Available at: <http://www.latercera.com/noticia/deportes/2015/03/656-620684-9-barristas-de-colo-colo-y-u-de-chile-protagonizan-incidentes-tras-practicas-para.shtml>. Visited in October 2015)
- Lafortezza, R. Carrus, G. Sanesi, G. and Davies, C. (2009) 'Benefits and well-being perceived by people visiting green spaces in periods of heat stress. 8 (2) 97 – 108
- Lafortezza, R. Davies, C. Sanese, G. and Konijnendijk, CC (2013) 'Green Infrastructure as a tool to support spatial planning in European Urban Regions'. *iForest – Biogeosciences and Forestry* (early view): e1-e7
- Lambregts, B. and Zonneveld, W. (2004) 'From Randstad to Deltametropolis. Changing Attitudes Towards the Scattered Metropolis'. *European Planning Studies*. 12 (3) 299-323
- Lebowitz, A. and Trudeau, D. (2016) 'Digging in: lawn dissidents, performing sustainability, and landscapes of privilege'. *Social & Cultural Geography*, 1-26
- León Balza, S. (1998) 'Conceptos sobre espacio público, gestión de proyectos y lógica social: reflexiones sobre la experiencia chilena'. *EURE* (Santiago), 24(71) 27-36

- Leontidou, L. and Couch, C. (2007) 'Urban Sprawl and Hybrid Cityscapes in Europe. Comparisons, Theory Construction and Conclusions'. *Urban Sprawl in Europe. Landscape, Land-Use, Change and Policy*. Oxford, UK
- Li, Q., Yuichi, F., and Morris, M. (2014) 'Study On The Buffer Zone Of A Cultural Heritage Site In An Urban Area: The Case Of Shenyang Imperial Palace In China'. *WIT Transactions on Ecology and the Environment*, 191, 1115-1123.
- Link, F. (2008) 'From Polycentricity to Fragmentation in Santiago de Chile' *Centro-h, Revista de la Organización Latinoamericana y del Caribe de Centros Históricos* 2 (02) 13-24
- López, M. (1981) 'Expansión de las ciudades'. *EURE* 8 (22) 31-42
- López, E. (2005) 'Impacto del crecimiento de Santiago en el deterioro funcional de sus espacios peri-centrales'. *Scripta Nova. Revista Electrónica de Geografía y Ciencias Sociales*. [En línea]. Barcelona: Universidad de Barcelona. 9(194). Available at: <http://www.ub.edu/geocrit/sn/sn-194-47.htm>
- López, E. (2008) 'Destrucción creativa y explotación de brecha de renta: discutiendo la renovación urbana del peri-centro sur poniente de Santiago de Chile entre 1990 y 2005'. *Scripta Nova: revista electrónica de geografía y ciencias sociales*. 12 (270). At: <http://www.ub.edu/geocrit/sn/sn-270/sn-270-100.htm>
- López, E. (2009) 'Urban Entrepreneurialism and Creative Destruction: A Case-Study of the Urban Renewal Strategy in the Peri-Centre of Santiago de Chile, 1990-2005'. Thesis submitted to DPU, UCL, 2009
- López, E. (2011) 'Gentrification by Ground Rent Dispossession: The Shadows Cast by Large-Scale Urban Renewal in Santiago de Chile'. *International Journal of Urban and Regional Research*, 35(2) 330-357
- López, E., Gasic, I. and Meza, D. (2012) 'Urbanismo pro-empresarial en Chile: políticas y planificación de la producción residencial en altura en el pericentro del Gran Santiago'. *Revista INVI*, 27(76) 75-114
- López-Morales, E. J. (2010). Real Estate market, state-entrepreneurialism and urban policy in the "gentrification by ground rent dispossession" of Santiago de Chile. *Journal of Latin American Geography*, 9(1), 145-173

- Loughran, K. (2014) 'Parks for profit: The high line, growth machines, and the uneven development of urban public spaces'. *City & Community*, 13(1), 49-68
- Loukaitou-Sideris, A. (1996) 'Cracks in the city: Addressing the constraints and potentials of urban design'. *Journal of Urban Design*, 1 (1), 91-103
- Low, S. (2006) 'Towards a theory of urban fragmentation: a cross-cultural analysis of fear, privatization, and the state'. *Cybergeo: European Journal of Geography*. Available at: <http://cybergeo.revues.org/3207>. Downloaded in October 2015
- Madaleno, I. and Armijo, G. (2004) 'Agricultura urbana en metrópolis iberoamericanas: estudio de casos en Santiago de Chile y Lisboa, Portugal'. *Investigaciones Geográficas, Boletín del Instituto de Geografía, UNAM*. 54: 36-54
- Madaleno, I. M., and Gurovich, A. (2004) 'Urban versus rural" no longer matches reality: an early public agro-residential development in periurban Santiago, Chile'. *Cities*, 21(6), 513-52
- Maillet, A. (2008) 'La gestación del Transantiago en el discurso público: hacia un análisis de políticas públicas desde la perspectiva cognitivista. *Nuevo Mundo, Mundos Nuevos*. Available at: <https://nuevomundo.revues.org/10932?lang=en> (visited in September 2015)
- Mariani, M. and Barron, P. (2013) *Terrain vague: interstices at the edge of the pale*. Routledge, NY
- Maruani, T. and Amit-Cohen, I. (2007) 'Open space planning models: A review of approaches and methods. *Landscape and Urban Planning*. 81 (1) 1-13
- Mathey, J., Rößler, S., Banse, J., Lehmann, I., and Bräuer, A. (2015) 'Brownfields as an element of green infrastructure for implementing ecosystem services into urban areas'. *Journal of Urban Planning and Development*, 141(3), A4015001
- Mazzoni, C. and Grigorovschi, A. (2015) 'Strasbourg Eurométropole, a cross-border conurbation towards new sustainable mobility patterns'. *Spatium*. 33, 18 – 25

- McClintock, N. (2010) 'Why farm the city? Theorizing urban agriculture through a lens of metabolic rift'. *Cambridge Journal of regions, economy and society*. rsq005. . 1 – 17
- Melo, P. (1996) 'Towards an efficient city: The case of Santiago, Chile. *Estudios de Economía, Departamento de Economía, Facultad de Ciencias Administrativas de la U. de Chile*. 23: 239-251
- Meyer-Cech, K. and Seher, W. (2013) 'Preservation of Farmlands in the Urban Fringe. A critical review of Planning Instruments Implemented'. *Land Management: Potential, Problems and Stumbling Blocks*. European Academy of Land Use and Development. Zürich
- Meza, C. (1996) 'Bolsones de pobreza intracomunales y espacios de inversión: El caso de la comuna de Conchalí, Chile'. En: *Información sobre población y pobreza para programas sociales-LC/DEM/R*. 262-1996-p. 310-325
- Ministerio de Agricultura (1980). Division of Lands, Properties of Agricultural Allotments. DFL N° 3.516/1980 for the division of rustic plots. Available at Biblioteca del Congreso Nacional's Archives, at: <http://www.leychile.cl/Navegar?idNorma=7155>. Visited on May 2015)
- Ministerio de Agricultura (2012) 'Análisis de los catastros sobre autorizaciones de cambio de uso de suelo de la región metropolitana de Santiago'. Estudio de impacto de la expansión urbana sobre el sector agrícola en la región metropolitana de Santiago. Centro de Información de Recursos Naturales. Oficina de Estudios y Políticas Agrarias del Ministerio de Agricultura (ODEPA). Santiago, Chile
- Ministerio de Agricultura. Instituto Nacional de Investigación Agropecuaria, INIA La Platina – Santiago: <http://www.inia.cl/centros-de-investigacion-regionales/inia-la-platina/> (visited in June, 2015)
- Ministerio de Economía, Fomento y Turismo, Chile (2014). División de Política Comercial e Industrial. Unidad de Estudios. 'El Cooperativismo en Chile. Unidad de Estudios. Santiago, Chile. Pp. 1 – 33
- Ministerio de Justicia. Subsecretaría de Prevención del Delito, Gobierno de Chile. Ley N° 19.327 'Estadio Seguro'. Ley de derechos y deberes en los espectáculos de fútbol profesional. 10 de Junio 2015. Available at:

[http://www.estadioseguro.gob.cl/sites/default/files/documento/ley\\_de\\_derechos\\_y\\_deberes\\_en\\_el\\_futbol\\_profesional.pdf](http://www.estadioseguro.gob.cl/sites/default/files/documento/ley_de_derechos_y_deberes_en_el_futbol_profesional.pdf) (visited in October 2015)

Ministerio de Planificación y Cooperación, MIDEPLAN. Encuesta CASEN 2003-2009 (Encuesta). Biblioteca del Congreso Nacional de Chile - BCN. Reportes estadísticos y Comunales 2012. Available at: [http://reportescomunales.bcn.cl/2012/index.php/El\\_Bosque#Poblaci.C3.B3n\\_seg.C3.BAn\\_pobreza\\_CASEN\\_2003-2009](http://reportescomunales.bcn.cl/2012/index.php/El_Bosque#Poblaci.C3.B3n_seg.C3.BAn_pobreza_CASEN_2003-2009). Visited in October 2015

Ministerio de Vivienda y Urbanismo, MINVU (1994) 'Plan Regulador Metropolitano de Santiago'. Secretaria Regional de Vivienda y Urbanismo. Santiago, Chile

Ministerio de Vivienda y Urbanismo, MINVU (1998) 'Memoria explicativa del Plan Regulador de Santiago. Incorporación de las comunas de Colina, Lampa y Til-Til'. Santiago, Chile.

Ministerio de Vivienda y Urbanismo, MINVU (2007). Updated text of the Supreme Decret N 14, (V. y U) of 2007D.O. de 12.04.07. Available at: [http://www.minvu.cl/opensite\\_20061113165715.aspx](http://www.minvu.cl/opensite_20061113165715.aspx)

Ministerio de Vivienda y Urbanismo, MINVU (2013). Secretaria Regional Ministerial. Memoria Explicativa. Modificación Plan Regulador Metropolitano de Santiago. MPRMS 100. 'Actualización Áreas de Extensión Urbana y Reconversión'. Santiago, Chile

Ministerio de Vivienda y Urbanismo, MINVU (2014) 'Texto Actualizado y Compaginado, Ordenanza Plan Regulador Metropolitano de Santiago (PRMS). Available at: <http://metropolitana.minvu.cl/pag-m/documentacion-vigente-prms/> (visited on May 2015)

Ministerio de Vivienda y Urbanismo, MINVU (2014) Ordenanza General de urbanismo y Construcciones, OGUC (2014). Ministerio de Vivienda y Urbanismo, MINVU. D.F.L N°458/1975. At: [http://www.minvu.cl/opensite\\_20070404173759.aspx](http://www.minvu.cl/opensite_20070404173759.aspx)

Ministerio de Vivienda y Urbanismo, MINVU (2014). Secretaria Regional Ministerial. Ordenanza Plan Regulador Metropolitano de Santiago, PRMS 100. Santiago, Chile

Ministerio de Vivienda y Urbanismo, MINVU (2015) Programa de Recuperación de Barrios:

- [http://www.minvu.cl/opensite\\_20070212164909.aspx](http://www.minvu.cl/opensite_20070212164909.aspx). (Visited on May 2015)
- Ministerio de Vivienda y Urbanismo, MINVU, Ordenanza General de urbanismo y Construcciones, OGUC (2014). Ministerio de Vivienda y Urbanismo, MINVU. D.F.L N°458/1975. Capítulo 4, De los Estacionamientos, Accesos y Salidas Vehiculares. Artículo 2.4.3
- Ministerio de Vivienda y Urbanismo, MINVU, Ordenanza General de urbanismo y Construcciones, OGUC (2014). MINVU. D.F.L N°458/1975. Título 4, De la Arquitectura, Capítulo 1, De las Condiciones de Habitabilidad. Artículo 4.4.11
- Ministerio de Vivienda y Urbanismo, MINVU. Ley General de Urbanismo y Construcciones, LGUC, Octubre 2014 (Ley 20.791). Available at: [http://www.minvu.cl/opensite\\_20070404173759.aspx](http://www.minvu.cl/opensite_20070404173759.aspx) (Downloaded in October 2015)
- Ministerio del Medio Ambiente (2002). Corporación Nacional de Medio Ambiente, CONAMA. 'Áreas verdes en el Gran Santiago'. Santiago, Chile
- Ministerio del Medio Ambiente (2012) 'Diagnóstico de los suelos de la Región Metropolitana'. Servicio Nacional de Información Ambiental – SINIA. Centro de Documentación, Subsecretaría de Medio Ambiente
- Ministerio del Medio Ambiente, Chile (2011) 'Chapter 6, Disponibilidad de Áreas Verdes'. *Informe del Estado del Medio Ambiente*. Chile
- Mohammadi, J; Asghar, A. and Mobaraki, O. (2012) 'Urban Sprawl Pattern and Effective Factors on them: The case of Urmia city, Iran'. *Journal of Urban and Regional Analysis*. 04 (1) 77-89
- Monclús, F. J. (2003) 'The Barcelona model: and an original formula? From 'reconstruction'to strategic urban projects (1979–2004)'. *Planning perspectives*, 18 (4), 399-421
- Morán, N. and Aja, A. (2011) 'Historia de los huertos urbanos. De los huertos para pobres a los programas de agricultura urbana ecológica'. Departamento de Urbanística y Ordenación del Territorio, Escuela Técnica Superior de Arquitectura de Madrid (UPM)
- Morckel, V. (2015) 'Community gardens or vacant lots? Rethinking the attractiveness and seasonality of green land uses in distressed neighborhoods'. *Urban Forestry & Urban Greening*, 14(3), 714-721

- Moreira-Arce, D., De la Barrera, F., and Bustamante, R. O. (2015) 'Distance to suburban/wildland border interacts with habitat type for structuring exotic plant communities in a natural area surrounding a metropolitan area in central Chile'. *Plant Ecology & Diversity*, (ahead-of-print), 1-8
- Morgan, K. (2009) 'Feeding the city: The challenge of urban food planning'. *International Planning Studies*. 14 (4) 341-348
- Moris, R. (2008) 'Regeneración urbana: consolidación y sustentabilidad de un mercado en desarrollo'. In: *Mercado y Ciudad: Desafío de un país Urbano*. P. Allard (Ed.), Observatorio de Ciudades UC/BBVA. Editorial Valente. Santiago de Chile
- Morrison, N. (2010) 'A Green Belt under Pressure: The case of Cambridge, England'. *Planninf Practice & Research*, 25 (2) 157 – 181
- Mougeot, L. (2000) 'Urban agriculture: definition, presence, potentials and risks'. In *Growing cities, growing food: Urban agriculture on the policy agenda*. Feldafing, Germany. Pp. 1-42
- Musterd, S. (2005) 'Social and Ethnic Segregation in Europe: Levels, Causes, and Effects'. *Journal of Urban Affairs* 27 (03) 331–348
- Naes, P; Naes, T and Strand, A. (2011) 'Oslo's Farewell to Urban Sprawl'. *European Planning Studies* 19 (01) 113-139
- Naranjo, G. (2009) 'El rol de la ciudad infiltrada en la reconfiguración de la periferia metropolitana de Santiago de Chile'. *Estudios Geográficos*. 70 (266) 205 – 229
- Nechyba, T. and Walsh R. (2004) 'Urban Sprawl'. *The Journal of Economic Perspectives*. 18 (4) 177 – 200
- Nelson, A. (1999) 'Comparing States With and Without Growth Management Analysis Based on Indicators With Policy Implications'. *Land Use Policy* 16:121–127.
- Németh, J. and Langhorst, J. (2014) 'Rethinking urban transformation: Temporary uses for vacant land'. *Cities*, 40, 143-150
- Newman, D. (1997) 'Creating the fences of territorial separation: The discourses of Israeli-Palestinian conflict resolution'. *Geopolitics*, 2(2), 1-35
- Northam, R. (1971) 'Vacant Land in the American City'. *Lands Economics*. 47(4)345-355

- O'Callaghan, C. and Lawton, P. (2016) 'Temporary solutions? Vacant space policy and strategies for re-use in Dublin'. *Irish Geography*, 48(1), 69-87
- Odum, E. and Barret, G. (2006) *Fundamentals of Ecology*. Cengage Learning Latin America
- Olave D. (1984) 'Los espacios abiertos en el área metropolitana de Santiago'. *Revista Geográfica*, 100: 67-76
- Orellana, A., Allard, P., Néspolo, R., and Mercado, J. (2012) 'Gestión urbana municipal a escala metropolitana: modelos en competencia'. *Revista de Geografía Norte Grande*, (51), 67-80
- Orrego, C. (2014) 'Intendente alerta sobre vacío legal que permite a inmobiliarias construir sin mitigaciones viales'. *Diario La Tercera* (at: <http://www.latercera.com/noticia/nacional/2014/08/680-592253-9-intendente-alerta-sobre-vacio-legal-que-permite-a-inmobiliarias-construir-sin.shtml>). Visited on May 2015)
- Ortega, A., Astrid, J. and Hermida, M. C. (2015) 'Mega-regions in the Philippines: Accounting for special economic zones and global-local dynamics'. *Cities*, 48, 130-139
- Ortiz, J. and Aravena, E. (2002) 'Migraciones Intraurbanas y nuevas periferias en Santiago de Chile: Efectos en la sociogeografía de la ciudad'. *Revista Internacional de Ciencia y Tecnología de la Información Geográfica. GeoFocus (Artículos)*. 2: 49-60
- Ortiz, J. and Morales, S. (2002) 'Impacto socioespacial de las migraciones intraurbanas en entidades de centro y nuevas periferias del Gran Santiago'. *EURE*, 85(28) 171-185
- Pagano, M. and Bowman, A. (2000) 'Vacant Land in Cities: An Urban Resource'. *The Brookings Institution – Survey Series. Center on Urban & Metropolitan Policy*. 1-9
- Patrick, D. (2014) 'The matter of displacement: a queer urban ecology of New York City's High Line'. *Social & Cultural Geography*, 15(8), 920-941
- Patton, M. Q. (2005). *Qualitative research*. John Wiley & Sons, Ltd.
- Pavez, M. (1999) 'Inundaciones y desarrollo urbano: algunas reflexiones sobre el debate'. *Revista INVI*, 14(38) 3-14

- Pavez, M. (2011) 'Urban and Regional Walking and Mobility in the City Models for Santiago de Chile'. *Revista INVI* 26(71) 57-85
- Peiser, R. (2001) 'Decomposing Sprawl' *The Town Planning Review*. 72 (3) 275 – 298
- Perks, R. and Thomson, A. (2006b) *The Oral History Reader*. Second Edition. Routledge, New York NY
- Petermann, A. (2006) '¿Quién extendió Santiago? Una breve historia del Límite Urbano, 1953-1994'. In: *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 205-230. Centro de Estudios Públicos, 2006. Santiago, Chile
- Phelps, N. (2012) *An Anatomy of Sprawl. Planning and Politics in Britain*. Routledge Ed. London.
- Phelps, N. and Wood, A. (2011) 'The New Post-Suburban Politics?'. *Urban Studies* 48 (12) 2591-610
- Phelps, N. Wood, A. and Valler, D. (2010) 'A Postsuburban World? An Outline of a research Agenda'. *Environment and Planning* 42 (01) 366 - 383
- Philippopoulos-Mihalopoulos, A. (2016) 'Spatial justice in the lawscape. In: *Urban Interstices: The Aesthetics and the Politics of the In-between*, 87
- Plan de Desarrollo Comunal 2013-2017 de Padre Hurtado, PLADECO (2013). Informe Final, Tomo I. Secretaria Comunal de Planificación, SECPLA. I. Municipalidad de Padre Hurtado. Santiago, Chile
- Plan de Desarrollo Comunal de La Pintana, PLADECO 2012-2016 (2012). Secretaria de Planificación Comunal. I. Municipalidad de la Pintana. Santiago, Chile
- Plan de Desarrollo Comunal de Maipú, PLADECO (2004). Secretaría Comunal de Planificación, SECPLA. I. Municipalidad de Maipú. Santiago, Chile
- Plan de desarrollo Comunal de Puente Alto, PLADECO (2010). I. Municipalidad de Puente Alto, Puente Alto. Santiago, Chile
- Plan de Desarrollo Comunal de San Bernardo Bernardo, PLADECO (2011). Secretaria Comunal de Planificación, SECPLA. I. Municipalidad de San Bernardo. Santiago, Chile

- Plan Regulador Comunal de La Florida (2015). Plano de Zonificación. I. Municipalidad de La Florida. Santiago, Chile
- Plan Regulador Comunal de La Florida (2015). Texto Refundido, Ordenanza Local. Secretaria Comunal de Planificación, SECPLA. I. Municipalidad de la La Florida. La Florida, Santiago, Chile
- Plan Regulador Comunal de La Pintana (2002). Ordenanza Local. Secretaria de Planificación Comunal, SECPLA. I. Municipalidad de La Pintana, La Pintana, Chile.
- Plan Regulador Comunal de Maipú (2003). Memoria Explicativa. Secretaria Comunal de Planificación, SECPLA. I. Municipalidad de Maipú. Santiago, Chile
- Plan Regulador Comunal de Puente Alto (2002). Ordenanza Local. Secretaria de Planificación Comunal, SECPLA. I. Municipalidad de Puente Alto. Santiago, Chile
- Plan Regulador Comunal de San Bernardo and Lo Herrera (2011). Secretaria Comunal de Planificación, SECPLA. I. Municipalidad de San Bernardo. Santiago, Chile
- Plan Regulador de La Pintana. Memoria Explicativa (2008). I. Municipalidad de La Pintana. Secretaria Metropolitana de Vivienda y Urbanismo. Santiago, Chile
- Plumtree, A. and GuUberg, R. (1980) 'Influence of Interstitial and Some Substitutional Alloying Elements'. Toughness of Ferritic Stainless Steels. American Society for Testing and Materials, pp. 34-55
- Polidoro, M; De Lollo J. and Vizintim, M. (2011) 'Environmental Impacts of Urban Sprawl in Londrina, Paraná, Brazil'. Journal of Urban and Environmental Engineering 05 (02) 73-83
- Pontes, L. and Cardoso, A (2016) 'Open spaces: windows for ecological urbanism in the Western Amazon'. Urbe, Revista Brasileira de Gestão Urbana, 8(1), 96-112. Epub December 15, 2015
- Ponzini, D. and Vani, M. (2014) 'Planning for military real estate conversion: collaborative practices and urban redevelopment projects in two Italian cities'. Urban Research & Practice, 7(1), 56-73
- Prévôt-Schapira, M-F and Cattaneo, R. (2008) 'Buenos aires: la fragmentación en los intersticios de una sociedad polarizada. EURE, 34(103), 73-92

- Qian, H. and Wong, C. (2012) 'Master Planning under Urban-Rural Integration: The case of Nanjing, China' *Urban Policy and Research*. 30 (4) 403 – 421
- Quiroga, B. (2005) 'Precios hedónicos para valoración de atributos de viviendas sociales en la Región Metropolitana de Santiago'. Munich Personal RePEc Archive – MPRA paper. N°378. Facultad de Ciencias Económicas y Administrativas, Instituto de Economía. P. Universidad Católica de Chile. Santiago. Available at: <http://mpra.ub.uni-muenchen.de/378/>. Visited at Junio 2015)
- Ravetz, J. and Loibl, W. (2011) 'The dynamics of the peri-urban: global change and regional response'. In: *Peri-urbanisation in Europe: towards European policies to sustain urban-rural futures; synthesis report; PLUREL [sixth framework programme]*. Piorr, A., Ravetz, J. and Tosics, I. (Ed.). Forest & Landscape, University of Copenhagen.
- Rayback, S. (2016) 'Making observations and measurements in the field'. In: *Key methods in geography*. Clifford, N., Cope, M., French, S. and Gillespie, T. (Eds.). (2016). Pp. 325-335. Sage, London
- Relph, Edward, 1976. *Place and Placelessness*. London: Pion.
- Reyes, S. and Figueroa, I. (2010) 'Distribución, superficie y accesibilidad de las áreas verdes en Santiago de Chile'. *EURE*, 36 (109) 89-110
- Richard, J. F. (2014) 'La Constitución Política y el urbanismo'. *Revista de Derecho Público. Edición Especial*. Pp. 115-121
- Richards, D. (1996) 'Elite interviewing: Approaches and pitfalls'. *Politics*, 16 (3), 199-204
- Richter, F. (2013) 'La agricultura urbana y el cultivo de sí. Los huertos de ocio a la luz de las dinámicas neorurales'. *ENCRUCIJADAS. Revista crítica de Ciencias Sociales*. 6, 129 – 145
- Rivera, A. (2012) 'Historia de la política habitacional en el área metropolitana de Santiago'. *Revista CIS – Centro de Investigación Social de TECHO*. 10: 27-44
- Roberts, K. (1994) '*Renovation in the Revolution? Dictatorship, Democracy, and Political Change in the Chilean Left*'. No. 203. Helen Kellogg Institute for International Studies

- Roberts, L. (2016) 'interpreting the visual'. In: *Key methods in geography*. Clifford, N., Cope, M., French, S. and Gillespie, T. (Eds.). (2016). Pp. 233-247. Sage, London
- Rocha, R. (2005) 'Políticas de vivienda social en el Gran Santiago: proletarianización de los sectores populares urbanos'. *Revista Electrónica de Geografía y Ciencias Sociales Scripta Nova*. 9(194). Available at: <http://www.ub.edu/geocrit/sn/sn-194-31.htm>
- Rodríguez, A. and Sugranyes, A. (2004) 'El problema de vivienda de los "con techo"'. *EURE*, 30 (91) 53-65
- Rodríguez, A. and Winchester, L. (2001) 'Santiago de Chile: Metropolización, globalización, desigualdad'. *EURE (Santiago)*, 27 (80) 121-139
- Rodríguez, A. and Winchester, L. (2004) 'Santiago de Chile: Una ciudad fragmentada'. *Santiago en la globalización: ¿una nueva ciudad?* SUR, Centro de Estudios Sociales y Educación
- Rodríguez, A., and Sugranyes, A. (2004) 'El problema de vivienda de los "con techo"'. *EURE*, 30(91), 53-65
- Rodríguez, J. (2012) '¿Policentrismo o ampliación de la centralidad histórica en el Área Metropolitana del Gran Santiago? Evidencia novedosa proveniente de la encuesta Casen 2009'. *EURE* 38(114) 71-97
- Rojas, C., Muñiz, I. and Pino, J. (2013) 'Understanding the Urban Sprawl in the Mid-Size Latin American Cities through the Urban Form: Analysis of the Concepcion Metropolitan Area (Chile)'. *Journal of Geographic Information System*, (5) 222-234
- Romero, H. and Órdenes, F. (2004) 'Emerging Urbanization in the Southern Andes. Environmental Impacts of Urban Sprawl in Santiago de Chile on the Andes Piedmont'. *Mountain Research and Development*. 24 (3) 197 – 201
- Romero, H., Vázquez, A., Fuentes, C., Salgado, M., Schmidt, E.B. (2014) 'Assesing urban environmental segregation (UES). The case of Santiago de Chile'. *Ecological Indicators*. 23: 76-87
- Rottle, N. (2016) 'Developing a Regional Open Space Strategy (ROSS) for Central Puget Sound, Washington State, USA'. *Environmental Science & Policy*, 62, 133-138.

- Roubelat, L. and Armijo, G. (2012) 'Urban Agriculture in the Metropolitan Area of Santiago de Chile. An Environmental Instrument to Create a Sustainable Model'. PLEA 2012 – 28th Conference, Opportunities, Limits & Needs Towards an environmentally responsible architecture Lima, Perú 7-9 November 2012
- Sabatini, F. (2000) 'Reforma de los mercados de suelo en Santiago, Chile: efectos sobre los precios de la tierra y la segregación residencial'. *EURE*, 26(77), 49-80
- Sabatini, F. and Arenas, F. (2000) 'Entre el Estado y el mercado: resonancias geográficas y sustentabilidad social en Santiago de Chile'. *EURE*, 26 (79) 95-113
- Sabatini, F. and Salcedo, R. (2007) 'Gated communities and the poor in Santiago, Chile: Functional and symbolic integration in a context of aggressive capitalist colonization of lower-class areas'. *Housing Policy Debate*. 18, 577-606
- Sabatini, F., Cáceres, G., and Cerda, J. (2001) 'Segregación residencial en las principales ciudades chilenas: Tendencias de las tres últimas décadas y posibles cursos de acción'. *EURE* 27(82) 21-42
- Sabri, Soheil and Yaakup, Ahris (2008) 'Multi-Criteria Decision Making for Urban Sprawl, using Analytic Network Process and GIS, Case of Iskandar Malaysia Region'. In: MAP ASIA 2008 – 7th Annual Asian Conference and Exhibition on Geographical Information Technology and Applications.
- Salazar, A. (2010) 'Transformaciones socio-territoriales en la periferia metropolitana: La ciudad periurbana, estrategias locales y gobernanza en Santiago de Chile'. *Revista electrónica de geografía y ciencias sociales. SCRIPTA NOVA*, XIV (47). <http://www.ub.edu/geocrit/sn/sn-331/sn-331-47.htm>
- Salazar, A. and Cox, T. (2014) 'Accesibilidad y valor de suelo como criterios para una localización racional de vivienda social rural en las comunas de San Bernardo y Calera de Tango, Chile'. *Revista INVI*, 29(80), 53-81
- Salcedo, R. (2002) 'El espacio público en el debate actual: Una reflexión crítica sobre el urbanismo post-moderno'. *EURE (Santiago)*, 28(84) 5-19

- Salet, W. and Woltjer, J. (2009) 'New concepts of strategic spatial planning dilemmas in the Dutch Randstad region'. *International Journal of Public Sector Management*. 22 (3) 235 - 248
- Sanches, P. and Pellegrino, P. (2016) 'Greening potential of derelict and vacant lands in urban areas'. *Urban Forestry & Urban Greening*, 19, 128-139
- Sánchez, R., Velasco, F., and Medina, M. (2013) 'Modelación espacial para la identificación de subcentros de empleo en el Gran Santiago'. In XIV Congreso Chileno de Ingeniería de Transporte (No. 16), Santiago, Chile
- Sandström, U. (2002) 'Green Infrastructure Planning in Urban Sweden'. *Planning practice & Research*. 17 (4) 373 - 385.
- Santa María, I. (1973) 'El desarrollo urbano mediante los "asentamientos espontáneos": el caso de los "campamentos" chilenos'. *Revista EURE-Revista de Estudios Urbano Regionales*, 3(7) 103-112
- Saunders, J. (2011) 'Recreational and Ecological Politics in the In-Between City: The Ongoing Development of Downsview Parks'. In: *In-Between Infrastructure: Urban Connectivity in an Age of Vulnerability*. Ed: Douglas Young, Patricia Wood, Roger Keil. Pp. 237 – 249
- Savarda , J. Clergeaub, P. and Mennechez, G. (2000) 'Biodiversity concepts and urban ecosystems'. *Landscape and Urban Planning*. 48 (3-4) 131–142
- Saxena, A. and Sharma, A. (2013) 'Importance of Relationship Between Built Forms Amidst Open Spaces in Historical Areas'. *International Journal of Engineering Research & Technology (IJERT)*. 2 (2) 1-12
- Schiappacasse, P. and Müller, B. (2004) 'Desarrollo metropolitano integrado: El caso de Santiago de Chile'. *Revista URBANO*. 7(10) 68 – 74
- Schlack, E. (2007) 'Espacio público'. *ARQ (Santiago)*. (65) 25-27
- Schmidt, C. (1998) 'The Specter of Sprawl'. *Environmental Health Perspectives*. 106 (6) 274 – 279
- Schulze, A (2010) 'Containing Urban Sprawl? Comparing Brownfield Reuse Policies in England and Germany'. *International Planning Studies* 15 (1) 25-35

- Sepúlveda, R and Larenas, J (2011) 'Regeneración urbana. Reflexiones sobre la sustentabilidad urbana en el contexto de las estrategias de recuperación barrial en Chile y Cataluña'. Cuadernos de Investigación Urbanística, (68): 70-82
- Sepúlveda, R. (2009) 'Mejoramiento Barrial: El desafío de pasar de un Programa Gubernamental a una Política de Estado'. *Novedades INVI* 49 (2009) (available at: <http://invi.uchilefau.cl/index.php/mejoramiento-barrial-el-desafio-de-pasar-de-un-programa-gubernamental-a-una-politica-de-estado/>)
- Sepúlveda, R. and Larenas, J. (2010) 'Regeneración urbana. Reflexiones sobre la sustentabilidad urbana en el contexto de las estrategias de recuperación barrial en Chile y Cataluña'. Centro de Investigación Urbanística. 68. Ciudad y Arquitectura, 4to grupo. Simposio La Serena 68. P. 70-82
- Sepúlveda, R., Larenas, J., Prado, V., Prat, B. and Álvarez, J. (2009) 'Bicentenario: Oportunidad de repensar las políticas urbano-habitacionales en Chile'. *Revista INVI*, 24(67), 21-67
- Shaw, P. and Hudson, J. (2009) 'The Qualities of Informal Space: (Re) appropriation within the informal, interstitial spaces of the city'. In: *Proceedings of the conference occupation: negotiations with constructed space*. Brighton: University of Brighton
- Shelby, B. and Harris, R. (1985) 'Comparing methods for determining visitor evaluations of ecological impacts: Site visits, photographs, and written descriptions'. *Journal of Leisure Research*, 17(1), 57-67
- Siavelis, P. (2008) 'Bachelet's Chile: Business as Usual?'. *GOLBAL DIALOGUE*. 10: 2-11
- Siedentop, S. and Fina, S. (2010) 'Monitoring Urban Sprawl in Germany: towards a GIS-based Measurement and Assessment approach'. *Journal of Land Use Science*. 5 (2) 73 – 104
- Sierra, L. (2006) 'Urbanismo por Decreto: Centralismo y confusión institucional en la ciudad Chilena'. In *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 299-328. Centro de Estudios Públicos, 2006. Santiago, Chile
- Sieverts, T (2011) 'The In-Between City as an Image of Society: From the Impossible Order Towards a Possible Disorder in the Urban

- Landscape'. In: *In-Between Infrastructure: Urban Connectivity in an Age of Vulnerability*. Ed. Douglas Young, Patricia Wood, Roger Keil. Pp. 19-27
- Sieverts, T. (2003) *Cities Without Cities. An Interpretation of the Zwischenstadt*. Spon Press. London and NY
- Sobal, J. and Wansink, B. (2007) 'Kitchenscapes, tablesapes, platescapes, and foodscapes influences of microscale built environments on food intake. *Environment and Behavior*'. *Environment and Behavior*. 39 (1) 124 -14
- Soule, D. (2006) 'Defining and Managing Sprawl'. *Urban Sprawl: a comprehensive reference guide*. Greenwood Publishing Group, Inc. The US
- Sousa Matos, R. (2009) 'Urban Landscape: Interstitial Spaces'. *Landscape Review*, 13 (1), 61-71
- Soyka, D. (2007) 'Interfictions, edited by Theodora Goss and Delia Sherman'. *Strange Horizons*. Retrieved 9, January 2011
- Spencer, H. (2007) 'Public Benefits of Undeveloped Lands on Urban Outskirts: Non-Market Valuation Studies and their Role in Land Use Plans'. Andrew Young School of Policy Studies. Research Paper Series. Working Paper, Department of Economics Fiscal Research Center. Pp. 01-29
- Stamps, A. and Smith, S. (2002) 'Environmental Enclosure in Urban Settings'. *Environment and Behavior* 34 (1) 781 – 794
- Stanley, B. (2014) 'Local property ownership, municipal policy, and sustainable urban development in Phoenix, AZ'. *Community Development Journal*, bsu062
- Steele, W. and Keys, C. (2015) 'Interstitial space and everyday housing practices'. *Housing, Theory and Society*, 32 (1), 112-125
- Steinberg, F. (2002) 'Strategic Urban Planning in Latin America: Experiences of Building and Managing the Future'. Institute for Housing and Urban Development Studies - HIS - SINPA PAPERS, N°22, Rotterdam
- Stigt, R., Driessen, P. and Spit, T. (2013) 'Compact City Development and the Challenge of Environmental Policy Integration: A Multi-Level

Governance Perspective, Environmental Policy and Governance. 23  
(4) 221 – 233

- Sugranyes, A., and Morales, R. (2012) 'Resistencia y propuestas hacia el derecho al suelo'. AA. VV. *Derecho al suelo y la ciudad en América Latina. La realidad y los caminos posibles*. TRILCE Uruguay, Comité Cooperativo Sueco y Hábitat International Coalition, Montevideo, 27-44
- Sutherland, A; Da Silva Wells, C; Darteh, B. and Butterworth, J. (2012) 'Researchers as actors in urban water governance? Perspectives on learning alliances as an innovative mechanism for change'. *International Journal of Water* 6 (3/4) 311 - 329
- Tacoli, C. (1998) 'Rural-Urban Interactions: A Guide to the Literature'. *Environment and Urbanization* 10 (01) 147-166
- Talen, E. (2010) 'Zoning For and Against Sprawl: The Case for Form-Based Codes'. *Journal of Urban Design*, 18 (2) 175-200
- Tapia, R (2011) 'Social Housing in Santiago. Analysis of its Locational Behavior between 1980-2002'. *Revista INVI*, 73 (26) 105-131
- Tapia, R. (2013) 'Evolution of the Spatial Pattern of Social Housing in Gran Santiago, Chile. 1980-2010'. *Revista Geográfica Venezolana*. 55(2) 255-274
- Tengberg, A., Fredholm, S., Eliasson, I., Knez, I., Saltzman, K. and Wetterberg, O. (2012) 'Cultural ecosystem services provided by landscapes: assessment of heritage values and identity'. *Ecosystem Services*, 2, 14-26
- Tewdwr-Jones, M. (2010) 'Green Belts or Green Wedges for Wales? A flexible Approach to Planning in the urban Periphery'. *Regional Studies* 31 (01) 73-77
- The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2009. Published by Houghton Mifflin Company
- Theobald, D. M. (2001) 'Land-use dynamics beyond the American urban fringe'. *Geographical Review*, 91(3), 544-564
- Thierfelder, H. and Kabisch, N. (2016) 'Viewpoint Berlin: Strategic urban development in Berlin—Challenges for future urban green space development'. *Environmental Science & Policy*, 62, 120-122

- Thomas, J. and Walsh, R. (2004) 'Urban Sprawl'. *The Journal of Economic Perspectives* 18 (4) 177-200
- Thomas, K. and Littlewood, S. (2010) 'From Green Belts to Green Infrastructure? The Evolution of a New Concept in the Emerging Soft Governance of Spatial Strategies'. *Planning Practice & Research* 25 (02) 203-222
- Thomas, P. (2001) 'Urban Sprawl: The English Dilemma'. *Natural resources & Environment*. 15 (4) 252 – 255, 278 – 280
- Tokman, A. (2006) 'El MINVU, la política habitacional y la expansión excesiva de Santiago'. In *Santiago: Dónde estamos y hacia dónde vamos*. Ed. Alexander Galetovic. 489-520. Centro de Estudios Públicos, 2006. Santiago, Chile
- Tomás, M. (2015) 'If Urban Regions are the Answer, What is the Question?' Thoughts on the European Experience. *International Journal of Urban and Regional Research*. 39 (2) 382 – 389
- Tonnelat, S. (2008) 'Out of frame' The (in) visible life of urban interstices—a case study in Charenton-le-Pont, Paris, France'. *Ethnography*, 9 (3), 291-324
- Torrens, P. (2006) 'Simulating Sprawl'. *Annals of the Association of American Geographers*, 96 (2) 248-275
- Trivelli, P. (2006) 'Grandes Proyectos Urbanos como instrumento de intervención pública en las ciudades'. *Revista de Arquitectura*, Universidad de Chile. 13: 62-66
- Trivelli, P. (2011) 'La propuesta de modificación del Plan Regulador Metropolitano de Santiago PRMS 100 requiere una justificación más sólida'. *EURE*, 37(111) 179-184
- Truffello, R. and Hidalgo, R. (2015) 'Policentrismo en el Área Metropolitana de Santiago de Chile: reestructuración comercial, movilidad y tipificación de subcentros'. *EURE*, 41(122), 49-73
- Tzoulas, K. Korpela, K. Venn, S. Yli-Pelkonen, V. Kazmierczak, A. Niemela, J. and James, P. (2007) 'Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review'. *Landscape and Urban Planning* 81: 167-178
- United Nations (UN). Food and Agriculture Organization of United Nations, FAO (1996) 'Urban agriculture: an oxímoron? What is urban

- agriculture? In: The state of food and agriculture. World Review, III. Selected issues. 1996 (Rome: FAO). 43 – 57
- Universidad de Chile. Campus Antumapu. Presentación del Plan Maestro. April 2014. Universidad de Chile. Campus Sur (Antumapu). Availbale at: <http://www.uchile.cl/portal/presentacion/campus/7987/campus-sur> (visited in October 2015)
- Valdés, A. (1999) ‘Pobreza y Distribución del ingreso en una Economía de Alto Crecimiento: Chile, 1987-1995’. Estudios Públicos, 75, 5-47
- Valdivia, V., Álvarez, R. and Donoso, K. (2012) *La alcaldización de la política. Los municipios en la dictadura pinochetista*. Santiago, Lom Ediciones, 2012
- Valenzuela, L. (2010) ‘Integración social a través del espacio público’. Memoria explicativa, Ciudad Parque Bicentenario – Una nueva forma de hacer ciudad. Ministerio de Vivienda y urbanismo, Gobierno de Chile. 74-75
- Vallejo Garretón, R. and Pardo Lorenzo, D. (2008) ‘Derribando mitos sobre el Estado Empresario. Revista chilena de derecho, 35(1) 135-156
- Vallejo, R. and Pardo L. (2008) ‘Derribando mitos sobre el Estado Empresario’. Revista chilena de derecho. 35(1), 135-156
- Van Leeuwen, E. and Nijkamp, P. (2006) ‘The Urban-Rural Nexus; A study on Extended Urbanization and the Hinterland’. Studies in Regional Science. 36 (2) 283-303
- Van Oort, F. Burger, M and Raspe, O. (2010) ‘On the Economic Foundation of the Urban Network Paradigm: Spatial Integration, Functional Integration and Economic Complementarities within the Dutch Randstad’. Urban Studies. 47 (4) 725 – 748
- Vásquez, A. and Weiland, U. (2011) ‘Potential of Urban Riparian Green and open Spaces in Adapting Cities to Climate Change. Multi-functional Greenways Opportunities in Samtiago de Chile?’. In the proceeding of the 2nd World Congress on Cities and Adaptation on Climate Change, Bonn, Germany
- Vejre, H; Primdahl, J. and Brandt, J. (2007) ‘The Copenhagen Finger Plan. Keeping a Green Space Structure by a Simple Planning Metaphor. Europe’s living landscapes. Essays on exploring our identity in the countryside’. LANDSCAPE EUROPE / KNNV

- Veltz, P. (1996) 'Polarización espacial de las actividades. Villes – Cities' Ciudades, cohesión social y dinámica de los territorios'. Bienestar Urbano. Los valores de la ciudad. HABITAT II. Estambul. Cumbre sobre la ciudad. 167-170
- Verderber, S., and Fine, D. J. (2000) *Healthcare architecture in an era of radical transformation*. Yale university Press.
- Verdugo, M. (2003) 'Programa de repoblamiento comuna de Santiago: Un programa de gestión urbana. Urbano, 6 (8) 53-61
- Vergara, L. (2014) 'El Estado subsidiario y sus políticas urbanas: la expulsión de los estratos bajos de la ciudad'. GeoGraphos. 5(62) 146-166 (available at: [http://rua.ua.es/dspace/bitstream/10045/35413/1/Luis\\_Vergara.pdf](http://rua.ua.es/dspace/bitstream/10045/35413/1/Luis_Vergara.pdf))
- Vicuña del Río, M. (2013) 'The Regulatory Framework within the Context of Business Administration and Commodification of urban Development in Greater Santiago, Chile'. Revista INVI, 28(78) 181-219
- Vidal, R (2002) *Fragmentation de la Ville et Nouveaux Modes de Composition Urbaine*. L'Harmattan. 5-7, Rue de L'Ecole-Polytechnique 75005 Paris, France.
- Vidal, R. (1999) 'Fragmentos en Tensión: Elementos para una teoría de la fragmentación urbana'. Revista Geográfica de Valparaíso (29-30) 149-180
- Vondrak, S. and Riley, D. (2005) 'Interstitial space design in modern laboratories'. Journal of architectural engineering, 11(2), 60-70
- Walmsley, A (1995) 'Greenways and the making of urban form'. Landscape and Urban Planning 33: 91-127
- Wandl, A., Rooij, R. M., and Rocco, R. C. (2012, May). 'Understanding the planning of open-spaces in territories-in-between: Dupuy's network urbanism approach applied to areas in-between urban and rural'. In RSA European Conference: "Networked regions and cities in times of fragmentation: Developing smart, sustainable and inclusive places", Delft, The Netherlands, 13-16 May, 2012. Regional Studies Association

- Wang, Z., Nassauer, J. I., Marans, R. W. and Brown, D. (2012) 'Different types of open spaces and their importance to exurban homeowners'. *Society & Natural Resources*, 25(4), 368-383
- Warf, B. (1997) 'The geopolitics/geoeconomics of military base closures in the USA'. *Political Geography*, 16(7), 541-563
- Weber, C. and Puissant, A. (2003) 'Urbanization pressure and modelling of urban growth: example of the Tunis Metropolitan Area'. *Remote Sensing of Environment*. 86(3) 341-352
- Weiland, U., Kindler, A., Banzhaf, E., Ebert, A. and Reyes-Paecke, S. (2001) 'Indicators for sustainable land use management in Santiago de Chile'. *Ecological Indicators* 11: 1074-1083
- Wells 56486 (1962) *Structural Inorganic Chemistry* 3rd edition Oxford University Press
- White, S. and Feiner, S. (2009) 'SiteLens: situated visualization techniques for urban site visits'. In: *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1117-1120). ACM. Boston, MA, USA
- Whittemore, A. (2016) 'Learning from lost landscapes: a role for local history in suburban infill strategies'. *Journal of urban Design*, 21(1), 105-123
- Wickham, J. Riitters, K. Wade, T. Vogt, P. (2010) 'A national assessment of green infrastructure and change for the conterminous United States using morphological image processing'. *Landscape and Urban Planning* 94: 186-195
- Wittig, R. and Schreiber, K. (1983) 'A quick method for assessing the importance of open spaces in towns for urban nature conservation'. *Biological Conservation*. 26 (1) 57 – 64
- Wolman, H., Galster, G., Hanson, R., Ratcliffe, M., Furdell, K., and Sarzynski, A. (2005) 'The fundamental challenge in measuring sprawl: which land should be considered?' *The Professional Geographer*, 57(1), 94-105
- Xiao-jing, W. and Yu-kun, Z. (2015) 'Thinking about urban agriculture in the aspect of the utilization of city space'. *Conference proceedings of the International Conference on Changing Cities II: Spatial, Design*,

*Landscape and Socio-economic Dimensions*. Porto Heli, Greece, June 22-26, 2015. Pp. 725 – 731

- Yeh, A. and X. Li. (1998) 'Sustainable land development model for growth areas using GIS'. *International Journal of Geographical Information Science* 12(2) 169-189
- Yin, R. K. (2009) *Case Study Research: Design and Methods*. Sage, London
- Zapata, I. and Arias, G. (2008) 'Impactos urbanos del programa regeneración de barrio, algunas orientaciones claves para la gestión futura'. *Revista INVI*, 23(63) 19-51
- Zegras, C. (2003) 'Financing transport infrastructure in developing country cities: evaluation of and lessons from nascent use of impact fees in Santiago de Chile'. *Transportation Research Record: Journal of the Transportation Research Board*, (1839), 81-88
- Zhang L. and Wang, H. (2006) 'Planning an ecological network of Xiamen Island (China) using landscape metrics and network analysis'. *Landscape and Urban Planning* 78: 449-456
- Zhang, R., Pu, L., and Zhu, M. (2013) 'Impacts of transportation arteries on land use patterns in urban-rural fringe: A comparative gradient analysis of Qixia District, Nanjing City, China'. *Chinese geographical science*, 23(3), 378-388
- Zhang, S. Abigail, Y. Boone, C. and Shrestha, M. (2012) 'Methodological Advances in the Spatial Analysis of Land Fragmentation'. *The Professional Geographer*, 65 (3) 512-526

## **APPENDIX A: LIST OF INTERVIEWEES**

**Interview 01:** Marcial Echeñique. Researcher and Director of the School of Architecture, University of Cambridge. 16 April, 2014

**Interview 02:** Pablo Navarrete. Architect in charge of the Social Housing Program Proposal for the Presidential Program of Michele Bachelet (2014-2018), 14 March 2014

**Interview 03:** Pablo Contrucci. National Director of Urban Development, MINVU. 05 May 2014

**Interview 04:** Pablo Fuentes. Director of the Department of Regional Planning, Metropolitan Regional Government of Santiago (GORE), 06 May 2014

**Interview 05:** Juan Pablo Olavarrieta. Architect in charge of 'Ciudad Parque Bicentenario' (CPB), SERVIU, MINVU, 07 May, 2014

**Interview 06:** Valentina Mardini. Architect in charge of 'Ciudad Parque Bicentenario' (CPB), SERVIU, MINVU, 07 May 2014

**Interview 07:** Roberto Moris. Researcher in Urban Studies at Institute of Territorial and Urban Studies (IEUT), Universidad Católica de Chile. Former Director of Urban Project 'Ciudad Parque Bicentenario' (CPB), MINVU, 08 May 2014

**Interview 08:** Gabriela Egaña. Professional at the National Service of Environmental Evaluation. Ministry of Environment. 09 May, 2014

**Interview 09:** Pía Montealegre. Architect and Consultant in charge of Urban Design for 'Parque Bicentenario' in CPB- MINVU, at Montealegre-Beach Architects, 09 May 2014

**Interview 10:** Felix De Amesti. Funder Member and partner of URBE Consultants, 12 May 2014

**Interview 11:** Patricio Hinrichsen. Director of Research and Development at La Platina, National Institute of Agricultural Research (INIA), Ministry of Agriculture, La Pintana commune, 12 May 2104

**Interview 12:** Nicolás Oddo. Professional Advisor at National SEREMI of Agriculture (2010-2014), 13 May 2014

**Interview 13:** Álvaro Cruzat. National Secretary of Agriculture (SEREMI 2010-2014), 13 May 2014

**Interview 14:** Claudia Bruna. Professional at the National Service of Environmental Evaluation. Ministry of Environment, 14 May, 2014

**Interview 15:** Juan Manuel Sánchez. Director of Advisors, Ministry of Public Works (MOP). Former Director of Urban Project ‘Ciudad Parque Bicentenario’, MINVU, 14 May 2014

**Interview 16:** Pablo Guzmán Bezanilla. Secretary of ‘Ciudad Parque Bicentenario – CPB’ Project, SERVIU, MINVU, 14 May 2014

**Interview 17:** Pablo Trivelli. Former Director of ‘Ciudad Parque Bicentenario’ Project at MINVU (2001-2004), 15 May 2014

**Interview 18:** Yasmín Martínez. Architect in charge of Infrastructural Development, Campus Antumapu, Faculty of Veterinarian Sciences, Universidad de Chile, La Pintana commune, 16 May 2014

**Interview 19:** Carmen Cruz. Coordinator of Housing and Real Estate Development at Chilean Chamber of Construction, C.Ch.C., 19 May 2014

**Interview 20:** José Auth Stewart: Deputy of the district N°20, communes of Cerrillos, Estación Central and Maipú. 22 May, 2014

**Interview 21:** Carlos Montes. Senator for the VIII Circunscripción de Santiago Oriente, 22 May 2014

**Interview 22:** Javier Hurtado. General Manager of Urban Studies at Chilean Chamber of Construction, 22 May 2014

**Interview 23:** Angélica Figueroa. Coordinator of Territorial Management Department of Urban Studies at Chilean Chamber of Construction, 22 May 2014

**Interview 24:** Graciela Ramos. Urban Planner and Advisor at Municipality of La Pintana, 23 May 2014

**Interview 25:** Guillermo Evia. Urban Planner and Advisor at Municipality of Cerrillos, 26 May 2014

**Interview 26:** Héctor Pineda. Urban Planner and Advisor at San Bernardo Municipality, 26 May 2014

**Interview 27:** Rogelio Gonzalez. Honorary Advisor and real estate developer, Chilean Chamber of Construction (C.Ch.C). 27 May 2014

**Interview 28:** Fernando Diaz Ibarra. Urban Planner and Advisor at Municipality of Lo Espejo, 28 May 2014

**Interview 29:** Gabriel Robles. Urban Planner and Advisor at Municipality of El Bosque Municipality, 28 May 2014

**Interview 30:** Esteban Yuretic. Urban Planner and Advisor at Municipality of La Florida, 05 May 2014

**Interview 31:** John Rathkamp. Architect and former General Manager of Aeronautic Studies in charge of Cerrillos Airport, Ministry of Public Works (MOP), 29 May 2014

**Interview 32:** Héctor Moreno. Urban Planner and Advisor at Puente Alto Municipality, 30 May 2014

**Interview 33:** Jaime Ravinet. Former Minister of Housing, Urbanization and Public Lands (2001-2004), 03 June 2014

**Interview 34:** Claudio Contreras. Urban Planner and Advisor at Municipality of Pedro Aguirre Cerda. 04 June, 2014

**Interview 35:** Mario Mendoza. Urban Planner and Advisor at Municipality of Padre Hurtado, 04 June 2014

**Interview 36:** Mónica Jara. Director of Community Organizations at Municipality of La Pintana, 10 June 2014

**Interview 37:** Felipe Marchant. Director of the Department of Environmental Operations. Municipality of La Pintana, 10 June 2014

**Interview 38:** Clara Tramo. Funder Member of the Union 'Huertos Obreros y Familiares' [Worker and Familiar Orchards] and Resident of 'Huertos Obreros', La Pintana commune, 10 June, 2014

**Interview 39:** Ricardo Vázquez. President of the Union 'Huertos Obreros y Familiares' [Worker and Familiar Orchards] and Resident of 'Huertos Obreros', La Pintana commune, 10 June 2014

**Interview 40:** Alfredo Miranda. President of Water Community Villa Las Rosas, La Pintana commune, 10 June 2014

**Interview 41:** Pedro Piña. Director of irrigation and member of the Agricultural Cooperative 'José Maza' at 'Huertos Obreros y Familiares' [Worker and Familiar Orchards], commune of La Pintana, 10 June 2014

**Interview 42:** Arturo Salinas. President and member of the Agricultural Cooperative 'José Maza' at 'Huertos Obreros y Familiares' [Worker and Familiar Orchards], commune of La Pintana, 10 June 2014

**Interview 43:** Cristian Tellez. Interview with a member of the Agricultural Cooperative 'José Maza' at 'Huertos Obreros y Familiares' [Worker and Familiar Orchards], commune of La Pintana, 10 June 2014

**Interview 44:** Alberto Gurovic. Researcher at Department of Urban Planning, Universidad de Chile, 12 June 2014

**Interview 45:** Sara Granados. Consulting in Local Food Systems at FAO-RLC, 12 May 2014

**Interview 46:** Emilio De la Maza. Director 'Planta-Banda' NGO, Espacio Padre Mariano. Municipality of Providencia of Providencia, 12 May 2014

**Interview 47:** Marta Figueroa. President of the Committee of Neighbours Villa San Ambrosio III, commune of La Pintana, 13 June 2014

**Interview 48:** Marjorie Celis. Interview with the Secretary of the Committee of Neighbours, Villa San Ambrosio III, commune of La Pintana, 13 June 2014

**Interview 49:** Juan Fuentes Riquelme. Resident at Villa San Ambrosio III and Police Officer at La Pintana commune, 13 June 2014

**Interview 50:** Patricio Bastias. Resident at Villa Ambrosio III, La Pintana commune. 13 June, 2014

**Interview 51:** Alexis Astorga. Resident at Villa San Gabriel, La Pintana commune. 13 June, 2014

**Interview 52:** Ana Figueroa. Resident of the Villa San Gabriel, La Pintana commune, 13 June 2014

**Interview 53:** Claudio Orrego. Intendant of the Metropolitan Region of Santiago, 20 June 2014

**Interview 54:** Carlos Aguirre. Director of the School of Construction and Researcher at Universidad de la Américas. 23 June, 2014

**Interview 55:** Manuel Valencia. Director of Environmental Management at Municipality of La Pintana, 25 June 2014

**Interview 56:** Gladys Morales. Urban Planner and Advisor at Municipality of Maipú, May 22 2014

## APPENDIX B: SEMI-STRUCTURED INTERVIEW SCHEDULE

### 1. INTRODUCTION AND PERTINENCE

1.1. What is your position and what is your relation with urban planning in Chile?

### 2. ABOUT SANTIAGO'S URBAN SPRAWL

2.1. What is your view about **the Chilean urban development**?

2.2. What is the **pattern of Santiago's urban growth/expansion**?

2.3. Why Santiago's shows this **pattern of growth**?

2.4. What is your critical view about **Santiago's urban growth**?

2.5. Who are the **main actors or institutions involved in Santiago's growth/expansion**?

### 3. ABOUT SANTIAGO'S INTERSTITIAL SPACES

3.1. Why an area in Santiago is (or remains) **without urbanization, empty, under-used, undeveloped, under-developed** or less developed?

3.2. How would you **define these spaces**?

3.3. What are **the current functions/uses** of these spaces?

3.4. What is **the value/importance** these spaces?

3.5. What are **the impacts** of these spaces?

3.6. Should these spaces **be transformed**? Yes? No? Why?

3.7. Who or What can (should) **lead the transformation** (integration) of these spaces?

3.8. Which one is **the most strategic** and **why**?

3.9. Have these spaces been **involved in any project**? Which one is it?

3.10. Who are **the owners** of these spaces?

3.11. What are **the owners' interests** on these areas?

## **APPENDIX C: INTERVIEW SAMPLE**

This is the interview N° 24 selected as sample. It was conducted at the Secretary of Planning (SECPLAN), Municipality of La Pintana, Santiago de Chile, after Consent Form signed by the interviewee.

**Interviewee: Graciela Ramos.** Urban Planner and Advisor at Municipality of La Pintana, Santiago, Chile, 23 May 2014

### **1. INTRODUCTION AND PERTINENCE**

#### **1.1. What is your position and what is your relation with urban planning in Chile?**

I am the Urban Planning Advisor. This position is in charge of the Communal Regulator Plan. This is a very complex task that cannot be faced by one person, neither by a small team. It requires agreements with political authorities to obtain its approval regarding matters of planning.

The other issue – related to urban planning – is to study and to inform to political authorities – in this case the Mayor – about the Metropolitan Regulator Plan of Santiago as well as the Intercommunal Plan that by law is also a task that I have to do, i.e. provide advice to the Mayor, to the council and the Communal Secretary of Planning in any matter related to the communal development. These are my three areas of work.

### **2. ABOUT SANTIAGO'S URBAN SPRAWL**

#### **2.1. What is your view about the Chilean urban development?**

The word 'expansion' takes back to me – immediately – to a modification that had the Metropolitan Regulator Plan of 1979 that coined the term 'area of urban expansion', and defined it as the area potentially able to be urbanised – promoted under the umbrella of the first urban development policy that considered the land as an 'endless resource'. The concept of 'urban expansion' is almost traumatic because from the aforementioned

modification and the arrival of this concept, Santiago grew in a very uncontrolled and disorganised way.

## **2.2. What is the pattern of Santiago's urban growth/expansion?**

Effectively, one characteristic of Santiago's growth is its leapfrogged pattern. In the case of the southern area, it had a very particular effect that consolidated a high socioeconomic homogeneity. i.e. who settled on these spots that sprouted away from the urban continuum were poor families, people of very low-incomes.

## **2.3. Why Santiago's shows this pattern of growth?**

The concept of 'expansion' evokes to me 'unplanned growth'. But this concept then was abandoned with the new PRMS/1994 that replaced the Intercommunal Plan and so, the concept of 'expansion' was complemented with 'extension'. The idea of the PRMS94 was...that this unregulated growth – those spots like tumours that appeared in different parts of the periphery – should be stopped and thus, the plan aimed to shrink this expansion and prioritise areas linked to some important roads, for instance.

In the case of La Pintana, it was agreed that some areas were used and so, aimed to be consolidated, and others were restricted for growth. This illustrated a consolidated North-South axe –the areas of El Roble and Santo Tomás. Then, another outer area was intended to be undensified and coincided with the Campus Antumapu (Universidad de Chile) and La Platina. The whole area is around 600 hectares...that is relevant. Additionally – and more rural – another stage coincided with the HuertosObreros y Familiares that are half (or one) hectare urbanisations. To the south, a very intense and highly densified area of El Castillo was defined. This map evinces the leapfrogged growth...and we can finish at the south with another semi-urbanised area with orchards. Further to the south we reach the Maipo River.

#### **2.4. What is your critical view about Santiago's urban growth?**

Finally, the PRMS94 stopped the expansive growth in intermediate areas, but the damage was done and had to do with the concentration of socioeconomic homogeneous low-income population.

When it grew, there were problems of connectivity at all levels. Modest people that should go to their workplaces had only the Santa Rosa Avenue...and their jobs?Gardeners, carpenters, builders, nannies that go from La Pintana to the East zone [the wealthy sector] ...and many lost their jobs because it took so long to arrive on time. Ant these people were low-income families that were concentrated here – along with others two or three communes – led by plans to eradicate the housing problem of that period. The standards were very low: a lack of land habitability, neighbourhoodsand urbanisation in general. So, the problem is inherent to the kind of people that came to occupy the zone.

### **3. ABOUT SANTIAGO'S INTERSTITIAL SPACES**

#### **3.1. Why an area in Santiago is (or remains) without urbanization, empty, under-used, undeveloped, under-developed or less developed?**

These lands are empty because their owners had these lands and were used by them. La Platina was an agricultural research centre. But if checking since the 70s until now, these lands are being shrinking (the area for research and experiments), although they say that they use the whole land. I saw it...some Directors of La Platina struggled that they cannot make experiments because of the arrival of 'poblaciones' [low-income neighbourhoods], so, the crops were stolen and damaged. In the case of Campus Antumapu, there are the Faculty of Agronomy, Veterinarian and Forestry Sciences. They do not use the whole land – that should have around 280 hectares or maybe more – but they use a portion anyway. The two institutions are worried because of the city arrival. That is complicated. Furthermore, there is a sense that they have a surplus of land as they are not using the 100%.

### **3.1.1. What about those lands further south?**

At the south of the Gabriela-Lo Blanco road there is a very dense area known as 'El Castillo' – which is also an area of social housing developments created in the 80s-90s. There is enough land used for crops, above all vineyards.

### **3.1.2. Do they still have agricultural uses?**

Yes, sure. That is a micro-climate very suitable for certain seeds (grapes), very valuable that still work fine. They are waiting (I think) the city arrival! Because those zones are 'grey' (between the city and the countryside), they are intermediate zones that always have the expectancy of the city arrival. We are beside, for instance...here at the south side of the municipality, there is a sector called 'Mapuhue' – which is a sector of Orchards – that based its creation on the law of 'HuertosFamiliares' in the 40s that was built in the 50s. Those are half hectare lands and when I speak to the owners they are expecting of what could happen, when the city arrives. Indeed, many of these properties are used with urban uses! As those properties are big enough, there are construction firms that have their headquarters and prime material stores there, cars reparation spaces and wasted materials, some schools...it is a mix between rural and urban uses. It is very interesting.

### **3.2. How would you define these undeveloped/empty spaces?**

The empty lands? We have huge hopes on these places as we see them as 'reservoirs' for urban improvements in La Pintana. Reservoirs to build the city we do not have. That means workplaces, services that we do not have, better housing standards (in comparison to the 80s and 90s). We think that those lands are valuable lands for the city, very valuable. We are afraid when there are so many projects, when they say "let's do this here or there". For instance, these two lands (Campus Antumapu and La Platina) ...the landlords...they want to deliver these lands to the city, but we are...(sceptical)...unless we see a proposal of 'what we are going to do here'. i.e. indeed there is a Sectional Plan to open the urban use of La Platina. But we disagree with. Because of the law, they asked us what we think but our opinion is not forced to be considered. That belongs to the MINVU (Ministry of Housing and Urbanisation) and they saw these lands

empty and surrounded by densified areas and they have the need of building more houses.

### **3.3. What are the current functions/uses of these spaces?**

La Platina is an agricultural research centre and Campus Antumapu belongs to the Universidad de Chile. In this area is the Faculty of Veterinarian, Forestry Sciences and Agriculture.

### **3.4. What is the value/importance these spaces?**

Answered in the 3.9, 3.9.1 and 3.9.2

### **3.5. What are the impacts of these spaces?**

Answered in the 3.9, 3.9.1 and 3.9.2

### **3.6. Should these spaces be transformed? Yes? No? Why?**

Answered in the 3.9, 3.9.1 and 3.9.2

### **3.7. Who or What can (should) lead the transformation (integration) of these spaces?**

I think that it should be led by a third entity. Those that currently we have...well, I immediately think on an 'urban development corporation'. I think on a specific entity in charge of these issues. We have some at municipal level – in fact we are in one of them now (Secretary of Planning, SECPLAN) – but this entity should not have in charge of planning but rather the 'implementation' – that is not the same and sometimes more complex. That should be in a different entity.

#### **3.7.1. Ok, that is because the MINVU does not do that?**

No! These issues should be addressed at a 'human scale' in the sense of addressing the metropolis part by part...defining zones and teams. At any case I also agree the idea of a 'great head' in charge of the whole metropolis.

#### **3.7.2. ...such as the Intendent?**

(No), because it sees so many things...i.e. it sees everything at a half. Also, it should be above political contingencies to ensure continuity to the processes. Anyway, in our case the Mayor has not been changed in almost 20 years. It is complicated because sometimes we are 'like aeroplanes' [working in a very efficient way] trying to achieve a goal in urban development and suddenly we are told 'now to the other way round'...and then the teams are disintegrated and that is not productive at all.

**3.7.3. And what is your power for the communal development?**

**Can you really plan or manage too?**

Not really. We can propose, but there is no effective management.

**3.7.4. If the MINVU wants to do something in the commune, could it do it without your agreement? Build houses, for instance...**

Yes, they can. All ministries – Public Works, for instance – they made the plan for a new access to Santiago passing through our commune without inconvenient. There is also a modification of the Regulator Plan to change the land use for La Platina without consultation to us, against our willingness, for instance. The Transantiago, for instance, built its Santa Rosa corridor although we had a proposal for a series of green spaces, a bicycle lane, barely considered. At central level when they have a project that crosses the commune they inform us. That means several meetings to inform and to see what we think, but generally the projects are done. So, it is not really a participative process but just informative. Other projects that have been done, for instance (for my surprise...ok) in the area of Mapuhue – where the half hectare orchards are – the SERVIU made (near six or seven years ago) a pavement of concrete of all streets. If you had walked there years ago that was a sort of wild space – although beside the urban noise and rural plots – so, it has drinking water and electric energy, i.e. it was not really abandoned...but the fact is that the pavement totally change the landscape: the land values, etc. And there was a disagreement among the owners regarding transforming the area in an urban space or preserving it as rural. It is a conflict because they are beside the city.

**3.7.5. These areas you mentioned...those of half hectare, are upper class people under the 3.516/80 law?**

No. Let's say they are not upper class families but rather middle class.

**3.7.6. So, they are not living in social houses?**

No! They were created under the law of 'Huertos Obreros y Familiares'. At any case, that was a social character law. The idea was that the person has a place to live but at the same time provide agricultural support, with cultivation and animals such as rabbits, etc. and to sell their products. Indeed, they were organised in cooperatives that looked for the land and accommodate families to then produce via horticulture and etc. That was the idea, very interesting.

**3.8. Which one is the most strategic and why?**

The most relevant are Campus Antumapu and La Platina. We – at the middle (or end) of the 90s – asked for a study and contracted a private consultancy to know what could be the best land use for those lands – that in total sum up around 600 hectares (it is not irrelevant).

**3.9. Have these spaces been involved on any project?**

We made the analysis – not only focused on communal benefits but also intercommunal – and for 'a,b,c' reasons it was determined that the best land-use was to create a large recreational centre, ecological, cultural...a megapark...a park for the southern zone, not only for La Pintana. For environmental reasons – specifically the dotation of green spaces – it was very relevant. There are green spaces but they are very small and do not reach the standards of the WHO (9m<sup>2</sup> per person). So, the data was collected, a Sectional Plan was made and after finishing that work we found a coincidence with central authorities that were looking for a place to relocate the metropolitan Zoo. So, as municipality we applied for the project to relocate the Zoo at La Pintana. It was analysed at central level – specifically by the MINVU – and finally accepted. Thus, a tender was launched to define the project, construction and the zoo park management. The current zoo occupied an area of 40 hectares but the project was for about 162 hectares, i.e. 4 times bigger. So, the project was tendered twice

but it did not have offers! i.e. there were some offers but there was not agreement. So, the project was failed and La Platina site was bought – almost all – by the SERVIU (Service of Housing and Urbanism, MINVU), which is an entity for building social housing. For legal reasons they bought it although there was still a free portion that was not transferred and then, the issues become messy and complicated. There are more than 10 years since those events and then, there presented a new Sectional Plan for those lands intended for recreational activities but now for housing – at least a portion – and a small part would be intended for parks. We were left very disappointed.

**3.9.1. A Metropolitan Zoo...would it finally be a tax attractor for the commune?**

Yes...but more than that I would reshape the communal face. It would mean an increment of the employment rate for the commune but also for neighbouring communes.

**3.9.2. Could you say that it would be a ‘sub-centre’?**

It had several environmental advantages. We appreciate our ‘micro-climate’ – sometimes so hot, sometimes so cold – as we consider it as a particularity and a comparative advantage that we would exploit. All in all, these two lands are strategic for the commune and always make us feel bad because we are not the owners! Because if we were...

**3.10. Who are the owners of these spaces?**

The Universidad de Chile (Campus Antumapu), and The National Institute of Agricultural Research (INIA). There are negotiations with the Service of Housing and Urbanisation (SERVIU) to transfer the land for social housing developments.

**3.11. What are the interests of owners/institutions on these areas? (Referring to the Orchards)**

But what happened? This area was ignited in the 50s...but over the years the children grew up and become professionals, their parents passed away and then they left the area to live in the city and the lands were left unoccupied

or undeveloped. There are still others...elders of around 60 years old ...and that is another issue...related to how some area get older along with their occupants. That is another interesting issue.

Nowadays these plots are gone, others are under speculation. Ten year ago you can hear a selling for 80 million...or 60 if you are lucky, but today they are selling near 400 million...300 are considered as a bargain.



Professor Nicholas Phelps  
Bartlett School of Planning  
UCL

13 March 2014

Dear Professor Phelps

**Notification of Ethical Approval**

**Project ID: 5588/001: The interstitial territory as a conceptual approach for undeveloped areas in sprawl. The case of Santiago de Chile**

I am pleased to confirm that in my capacity as Chair of the UCL Research Ethics Committee I have approved your study for the duration of the project i.e. until September 2016.

Approval is subject to the following conditions:

1. You must seek Chair's approval for proposed amendments to the research for which this approval has been given. Ethical approval is specific to this project and must not be treated as applicable to research of a similar nature. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing the 'Amendment Approval Request Form'.

The form identified above can be accessed by logging on to the ethics website homepage: <http://www.grad.ucl.ac.uk/ethics/> and clicking on the button marked 'Key Responsibilities of the Researcher Following Approval'.

2. It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. Both non-serious and serious adverse events must be reported.

**Reporting Non-Serious Adverse Events**

For non-serious adverse events you will need to inform Helen Dougal, Ethics Committee Administrator ([ethics@ucl.ac.uk](mailto:ethics@ucl.ac.uk)), within ten days of an adverse incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Chair or Vice-Chair of the Ethics Committee will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

**Reporting Serious Adverse Events**

The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator immediately the incident occurs. Where the adverse incident is unexpected and serious, the Chair or Vice-Chair will decide whether the study should be terminated pending the opinion of an independent expert. The adverse event will be considered at the next Committee meeting and a decision will be made on the need to change the information leaflet and/or study protocol.

On completion of the research you must submit a brief report (a maximum of two sides of A4) of your findings/concluding comments to the Committee, which includes in particular issues relating to the ethical implications of the research.

With best wishes for the research.

Yours sincerely



**Professor John Foreman**  
**Chair of the UCL Research Ethics Committee**

Cc:  
Cristian Lovera & Sonia Sallazzaro, Applicants  
Professor Mike Racco, Head of Department