



**MIND THE GAPS! A RESEARCH AGENDA FOR URBAN INTERSTICES**

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## Mind the Gaps! A Research Agenda for Urban Interstices

### Abstract

Processes of urbanisation can hardly be considered without reference to the spaces that lie between developments. However, the literature on such interstitial spaces is fragmentary. In this paper we draw together insights from the extant literature into a research agenda on urban interstices. We propose a research agenda centred on four themes: the multiple geographic scales at which the interstitial spaces of urban sprawl might be analysed; the pending nature of such spaces; their planned or unplanned character and their relational properties. We develop these themes, briefly illustrating them with reference to the case of metropolitan area of Santiago de Chile. In conclusion, we emphasise some of the implications of interstitial spaces for theories of urban politics and their value in forcing inter-disciplinarity in urban studies.

**Keywords:** Built Environment, Infrastructure, Land Use, Planning, Agglomeration/Urbanisation

### INTRODUCTION

The multifaceted nature of (sub)urban sprawl has been clarified recently (Galster *et al.*, 2001) while discussion of the social, economic and political processes operating on, the environmental content and ideological meaning of, the real estate developments that compose it found in literature on (post)suburbanization (Ekers *et al.*, 2010; Phelps and Wood, 2011; Phelps, Wood and Valler, 2010).

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3 Yet urbanisation can hardly be considered without reference to the undeveloped  
4 spaces between developments. To an extent, undeveloped land represents natural or  
5 regulatory constraints on developable land and affects the measurement of urban sprawl  
6 (Wolman et al, 2005). Quite apart from the facts that some such constraints are social or  
7 regulatory constructions which can be unmade or are natural features that could be  
8 'improved' or 'reclaimed' to allow development, vacant lands have been calculated to be  
9 substantial in American cities (Northam, 1971) and they may be on the increase in contexts of  
10 urban shrinkage (Dubeaux and Sabot, 2018). *We should be mindful of the quantitative*  
11 *significance of these gaps.*

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23 Vacant spaces might be considered inert non-places (Augé, 1995; Relph, 1976).  
24 Nothing could be further from the truth, as a diverse extant literature on urban *interstices*  
25 emphasizes (Brighenti, 2013; Choay, 2003; Foo et al, 2013; Gandy, 2009; Lévesque, 2013;  
26 Matos, 2009; Mohammadi, *et al.* 2012; Vidal, 2002). Rather, 'when one penetrates the  
27 system of interstitial spaces and starts to explore it, one realises that what has been called  
28 'empty' is not so empty after all. Instead, it contains a wide range of uses' (Matos, 2009: 66).  
29 Urban interstices comprise 'a parallel city with its own dynamics and structures that have yet  
30 to be understood' (Careri, 2002: 184) and yet are 'fundamental to the future of our cities'  
31 (Matos, 2009: 65). *We should be mindful of the qualities of these gaps.*

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43 Interstitial spaces offer an alternative analytical point of entry into the study of  
44 urbanisation. The extant literature uses a variety of terms, is fragmented and quite singular in  
45 its treatment of interstitial spaces in architectural, ecological or other terms. Here we present  
46 a unifying research agenda for understanding urban interstices. We begin by reviewing the  
47 literature that does touch on such interstitial spaces including that on urban fringe belts, green  
48 infrastructure, Sieverts's *zwischenstadt* and Vidal's inter-fragmentary spaces. These provide  
49 insights that we pull together in a subsequent section which presents four themes in a future  
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3 agenda for research on the interstices of urban sprawl namely: the scale at which interstitial  
4 spaces are apparent; their pending nature; their relationship to planning, and; their relational  
5 properties. We provide brief examples of these themes taken from original research of  
6 interstitial spaces in the metropolitan area of Santiago de Chile involving reviews of official  
7 documents and 56 semi-structured interviews with central, metropolitan and local  
8 government planners, politicians, developers and business interests, residents and  
9 environments and other community groups (author, forthcoming). We draw only lightly upon  
10 this case as a basis for abstraction and generalisation, though we believe the agenda is one  
11 that has salience to the vast majority of cities. Santiago de Chile provides a good example of  
12 the significance of interstitial spaces in a context of urban sprawl specifically. The city-region  
13 has been the subject of fragmented urban expansion linked to both ‘autoconstruction’ and  
14 privatized construction of housing and infrastructure in the past three decades with important  
15 consequences for social segregation (Borsdorf, Hidalgo and Sanchez, 2010; Dammerts, 2004;  
16 De Mattos, 2002; Heinrichs, Lukas and Nuissl, 2011; Sabatini et al, 2003). Less examined  
17 are the vacant spaces produced alongside the urbanization processes described by these  
18 authors. The original research focused on the south of Santiago de Chile - the most important  
19 axis for recent suburban expansion - and involved mapping and study of interstices identified  
20 as the most important by interviewees (see figure 1). The conclusions underline the value of  
21 integrating insights from the different disciplines concerned with the built environment but  
22 also the wider ramifications of this agenda for the field of urban studies: planning practice is  
23 brought to the centre of urban economic and geographical analysis; the competing interests  
24 operative on interstitial spaces lead directly to the question of ‘whose city?’ so central to  
25 theories of elite and grassroots urban politics; consideration of interstitial spaces necessarily  
26 leads in the direction of both scalar and relational ontologies.  
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3 ANTECEDENTS IN THE DISCUSSION OF THE INTERSTITIAL SPACES OF URBAN  
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10 A range of terms have been used which partly acknowledge undeveloped or underdeveloped  
11 land as part of urban sprawl – the concepts of fringe belts, green infrastructure, *zwischenstadt*  
12 and interfragmentary spaces being notable.  
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18 **Fringe belts: the functional diversity of non-urbanised land**  
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23 Notions of the urban fringe, fringe belt and expansion areas have been important in the urban  
24 morphological tradition. To the extent that the emphasis in this literature is on the  
25 morphological complexity of fringe areas, it also highlights the diversity of forces and  
26 interests involved in urban sprawl, including those operating upon interstitial spaces. Hebbert  
27 (1986: 141), for example, emphasises how the transitional zone surrounding cities ‘displays a  
28 mixture of uses and building types interspersed with agricultural and vacant land’. This  
29 literature also underlines a temporal dimension which needs to be made a part of any research  
30 agenda on the interstices of (sub)urban sprawl.  
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40 A fringe belt can be described as ‘a zone of largely extensive land uses that is formed  
41 at the edges of an urban area during a pause in outward residential growth. Each fringe belt ...  
42 has several distinctive features in terms of plan, building form, and land and building uses.  
43 Typical uses requiring extensive sites, include public utilities, parks, sports facilities, and  
44 allotment gardens’ (Larkham, 2006: 126-127). For Gallent and Shaw (2007), urban fringes  
45 are complex because of their random assemblage of morphologies and land uses. The  
46 physical and functional transformation of urban fringes implies tensions between existing and  
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3 encroaching uses which can exist over extensive periods of time to create multi-functional  
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5 landscapes (Whitehand and Norton, 2004).  
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7         The morphology of the fringe belt is partly a reflection of ‘leapfrog’ development;  
8 non-contiguous urbanisation made up by the presence of those open tracts in between such as  
9 farmlands, forest lands and other non-urbanized areas. In Gillham’s (2002: 4-5) words ‘the  
10 result is a haphazard patchwork, widely spread apart and seeming to consume far more land  
11 than contiguous developments. Unless preserved or unbuildable, the remaining open tracts  
12 are usually filled with new developments as time progresses’. Whitehand and Norton’s  
13 (2004) study of Birmingham’s Edwardian fringe belt reveals just how scattered the fragments  
14 of undeveloped or underdeveloped spaces left within the belt can be.  
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25         The unique pressures in the urban fringe belt have been important for promoting  
26 macro scale planning policies designed to preserve and promote open areas such as the ‘Five-  
27 Finger Plan’ of Copenhagen (Caspersen, *et al.* 2006; Gravsholt Busk, *et al.* 2006) and the  
28 ‘Green-Heart’ project in Netherlands (Kühn, 2003 Salet and Woltjer, 2009; Faludi, *et al.*  
29 1996). Yet the fact that ‘an unintended fringe belt may contribute as much to the legibility of  
30 a city as a fringe belt with a planned feature’ (Whitehand, 2001: 108) underlines both the  
31 planned and unplanned nature of interstitial spaces – a point to which we return later.  
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41         Time is a critical factor in the measurement of sprawl because - more than a  
42 description of a moment - sprawl is a process (Galster, *et al.* 2001). Sprawl, as a particular  
43 pattern of expansion, is recognized in such indicators as land conversion, population change,  
44 traffic and vehicle miles travelled energy consumption and fiscal measures (Nelson, 1999).  
45 Fringe belts and ‘expansion areas’ are always therefore ‘pending’ spaces under the logic  
46 speculation surrounding land development – though this is rarely a feature emphasised  
47 explicitly. Their condition centres on their accessibility or location relative to infrastructure  
48 and existing development as in the case of the Randstad in the Netherlands (Bruinsma, *et al.*  
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3 1993). The morphology of fringe belts in particular reflects the enduring obstacles to,  
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5 different cycles of, and innovation in, building activity over time (Whitehand, 2001).  
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### 8 9 **Green infrastructure: the ecological content of non-urbanised land**

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14 The concept of green infrastructure is associated with prospects for ecological modernization  
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16 - as a way ‘for the environment to support economic growth and investment, land property  
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18 values, labour productivity, tourism and agriculture’ (Thomas and Littlewood, 2010: 217).  
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20 Van Leeuwen and Nijkamp, (2006: 292) detect possibilities for green infrastructure in an  
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22 ‘urbanized countryside’ to provide for a shift from the productivist farming which typically  
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24 denuded natural processes, towards an agricultural sector in urban fringes having a greater  
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26 focus on food quality, environmental processes, and more sustainable ecosystems.  
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30 The scope of the green infrastructure concept is broad since it embraces the entire city  
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32 from the fringe to the city’s core – signalling the need for a focus on a variety of scales of  
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34 analysis. Green infrastructure consists of interconnected networks of spaces which are part of  
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36 ecosystems including parks, squares, green corridors, waterways, woodlands, public places  
37  
38 etc. It is these multi-scalar and relational properties of green infrastructure as networks of  
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40 places that we return to latter when elaborating the concept of the interstices of (sub)urban  
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42 sprawl.  
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46 Aside from their contributions to urban amenity, the ecological value of green  
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48 infrastructure in terms of preventing the loss of biodiversity, mitigating or reducing air and  
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50 noise pollution seem beyond doubt (La Rosa and Privitera, 2013). However, according to  
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52 Laforteza et al (2013), these areas generally have two main components: ‘hubs’ and  
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54 ‘corridors’ that involve several scales and functions where people can share some expressions  
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56 of wildlife. The concept of green infrastructure also supposes claims on political and policy  
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3 leadership and resourcing similar to those of ‘traditional’ infrastructure (Sandström, 2002).  
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5 Green-infrastructure has entered into land use and spatial planning policy; being understood  
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7 as ‘ecological-networks’ (Bennet and Mulongoy, 2006; Tzoulas, *et al.* 2007; Walmsley,  
8  
9 1995) but also as having a value in terms of contributing to the quality of the urban  
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11 environment (La Greca, *et al.* 2011: 2193).  
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### 14 15 16 ***Zwischenstadt: the regional scale city in-between*** 17 18 19

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21 The term *zwischenstadt* or ‘in-between’ territory has been used to depict a new urban  
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23 landscape (Sieverts, 2003, 2011) drawing attention to several features. First, the term refers  
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25 primarily to the urban-regional scale. Second, it focuses largely on the mixing of urban and  
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27 rural land. Third, there is an emphasis on the political and regulatory processes that have  
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29 produced this landscape.  
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32 The term *zwischenstadt* describes a new form of urbanisation that is neither city nor  
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34 country but instead the ‘urbanized landscape’ existing between the historical city centre and  
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36 the open countryside (Sieverts, 2003). According to Sieverts (2003, 2012) the *zwischenstadt*  
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38 is characterized by different degrees of urbanization and its diversity is related to the extent  
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40 and scale of undeveloped land. The space that Sieverts refers to is characterised by a blend of  
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42 land-uses and activities. In the *zwischenstadt* landscape, as others have described, open areas  
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44 such as ‘urban agriculture’ are a result of the mixing between social and economic demands  
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46 from urban surroundings (Tacoli, 1998: 157-158). The countryside shows some expressions  
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48 of urbanity such as farmlands for public visits, tourism activities and leisure places etc.  
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50 Moreover, urban surroundings start to define ways of life in that nearby urban fragments and  
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52 infrastructure provide rural residents employment and access to urban cultural activities (Van  
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54 Leeuwen and Nijkamp: 294)  
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3 'In-between' territory involves the whole suburban context mainly defined as a  
4 scattered process of development where several insulated built-up places coexist with pieces  
5 of countryside (Sieverts, 2003: 5-6). While the emphasis of Sieverts' discussion is not upon  
6 interstitial spaces per se, one of the key points to take from his concern with the in-between  
7 city is the significance of fragments of undeveloped land that exist at the regional scale.  
8 Partly because of the existence of these interstices and their regional scale, 'the fragmented  
9 urban landscape is not yet seen as part of our culture' (Sieverts, 2012: 20). That is, 'the in-  
10 between city is still unloved particularly by planners and opinion makers, and it is  
11 disregarded by urban design, planning and politics' (Sieverts, 2012: 20). Here interstitial  
12 spaces are implicated in a set of political, economic, environmental, regulatory and, to a  
13 lesser extent, cultural conflicts that beset the *zwischenstadt* since 'the open space of the  
14 landscape will become the actual creative field ... of the *zwischenstadt*' (Sieverts, 2003: 122).  
15 What Sieverts has in mind here are conflicts 'to do with the funding of regionally significant  
16 facilities, the retention and maintenance of open landscapes, the social segregation between  
17 the old city and the periphery and the migration of businesses from the core countries into the  
18 hinterland' (Siverts, 2003:127).  
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#### 40 **The relationality of inter-fragmentary spaces**

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45 Vidal's (1999, 2002) idea of 'inter-fragmentary space' emerged from a desire to explore the  
46 cross-boundary relations subsumed in Raffestin's (1986) emphasis upon the construction of  
47 boundaries and has two key features. First, the concept does refers to the architectonic scale  
48 between different urban fragments. Second, Vidal's approach is explicit on the *potential* and  
49 *relationality* of inter-fragmentary spaces as a result of changes to surrounding fragments and  
50 infrastructure of the built environment.  
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3 To understand 'inter-fragmentary space' it is necessary to consider that 'the urban  
4 phenomenon is essentially a permanent tension between fragments' (Vidal, 2002: 150). Thus,  
5 the relationship between urban fragments occurs through the inter-fragmentary space. The  
6 view of the contemporary city as one of fragments is not unique but the connotation of the  
7 term fragmentation is. For many, 'urban fragmentation' amounts to forms of segregation and  
8 has negative social, economic and political consequences. For Vidal, 'urban fragmentation' is  
9 a description of the potentialities of cities as territories made up of different physical entities  
10 with political, economic and social dimensions. Urban fragmentation is a process of 'addition  
11 or subtraction of different pieces which are part of a general urban trend' (Vidal, 1999: 158)  
12 yet also does not necessarily entail the physical coincidence of fragments and  
13 interdependency.<sup>1</sup> Inter-fragmentary space is defined as 'the field of relations where  
14 transitions between fragments are produced' (Vidal, 2002: 147). According to Vidal, 'urban  
15 fragments' are made up by a 'core' surrounded by a 'field', which is connected to the core.  
16 Yet, the 'inter-fragmentary space' is outside the fragment's field. Thereby, the inter-  
17 fragmentary space appears as a 'zone of reconciliation' which permits explicit recognition of  
18 an urban fragment's borderlands (Vidal, 2002).

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Vidal's ideas on inter-fragmentary or interstitial spaces appear somewhat contradictory. On the one hand, the meaning and content of inter-fragmentary spaces are modified according to transformations of the fragments around them. On the other hand, Vidal emphasises that an interstice 'is the signifier of the place's energy and also it transports important information about the meaning of a place'. As 'a sort of reservoir of space for the future expansions of fragments' (Vidal, 2002: 162-163), Vidal argues that an interstice is not

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<sup>1</sup> A specific social group could be identified as a 'social fragment' but may not coincide in its residence or everyday fields of action with a particular 'physical fragment' (Vidal, 1999: 159-169).

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3 a 'residue', 'remnant' or a 'vacuum' (Vidal, 2002: 164). Instead, the 'interstice is an  
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5 important place, a place of convergences of identities; a place of individual and collective  
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7 meaningfulness, a dynamic place, a place of places' (Vidal, 2002: 164-165).  
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## 10 11 TOWARDS AN AGENDA ON THE INTERSTICES OF URBAN SPRAWL 12 13

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16 Discussion of urban interstices dates at least to the Chicago School within which they were  
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18 seen as subject also to processes of competition for space in which the forces of 'social  
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20 disorganisation' (of gangs) dominated (Lévesque, 2013). Since these beginnings within one  
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22 of the founding traditions in urban studies, consideration of urban interstices has rather  
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24 moved to the margins of the field. Instead, literature has deployed the term in often very  
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26 specific ways. Gandy (2011, 2016) and Jorgensen and Tylcote (2007) treat interstices as  
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28 unintended, 'wild' spaces in which nature has reclaimed parts of the city. Brighenti (2013)  
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30 emphasises the sociological when treating interstices primarily as gaps to be penetrated by  
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32 the excluded in society. For Dovey (2012) and Shaw and Hudson (2009) interstices are  
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34 spaces in which urban informality and creativity can flourish, though for Matos (2009) these  
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36 spaces are by-products to be re-incorporated into formal development processes.  
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41 The *Shorter Oxford English Dictionary* defines an interstice as 'an intervening space  
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43 (usually empty) between things' but to this spatial aspect of an interstice must be added a  
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45 temporal aspect (Lévesque, 2013). In what follows, we suggest two further aspects of  
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47 interstices as the basis of an inclusive research agenda. First interstices are apparent at  
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49 *multiple geographical scales*. Unlike the terms *zwischenstadt* and inter-fragmentary space,  
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51 the term interstice is better suited to those scales that constitute the main subject matter of  
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53 urban studies. Second, we suggest it is a term that can encompass the potentiality or *pending*  
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55 nature of un- or underdeveloped spaces. Third, it is also one that speaks to the regulated  
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3 (*planned*) and seemingly unregulated (*unplanned* or unintended) character of un- and  
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5 underdeveloped spaces in the urban fabric.<sup>2</sup> Fourth, it is a term that conjures the *relational*  
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7 properties of cities given the networks of infrastructure and action that operate through such  
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9 spaces.  
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### 14 **Scale: proximity, transition, region and remoteness**

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18 It has been argued that urban interstices cannot be reduced to their morphological  
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20 characteristics (Brighenti, 2013a: xviii).<sup>3</sup> Nevertheless, the interstices of urban sprawl are  
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22 distributed so as to demand an analytical perspective that speaks to multiple geographical  
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24 scales.  
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28 The scales at which interstitial spaces emerge are closely related to the functional  
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30 capacities of land and institutional frameworks that restrict development. These different  
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32 scales frequently determine interstitial spaces as soon to be revamped, definitively abandoned  
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34 or protected, or perceived as a commodity. In Santiago de Chile rural spaces, restriction  
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36 areas, industrial and military facilities, buffers of security, infrastructural spaces, ecological  
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38 reservations and others appear at different scales at different parts of the city, play differing  
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40 roles in planning agendas and define different levels of integration including from totally  
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42 closed environments until open pieces of countryside without occupation constraints (see  
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44 figure 1).  
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### 47 **Figures 1 and 2**

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53 <sup>2</sup> The opposition here is rhetorical. Planning itself has been described as a dialectical activity  
54 (Gleeson and Low, 2000: 12).

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56 <sup>3</sup> Yet, as the logical opposites of the various dimensions of sprawl (Galster et al, 2001), these  
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58 might form part of a future research agenda.  
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3 Abstracting and simplifying from the Santiago de Chile case, we propose four  
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5 different scales of interstitial spaces depicted in figure 2. There are three qualifications to this  
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7 depiction. First, although Vidal's ideas on interfragmentary spaces are relevant to our agenda,  
8  
9 his emphasis is upon architectonic scales (e.g. spaces between buildings). We do not depict  
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11 this architectonic scale as one useful for understanding urbanisation. Second, although  
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13 Sieverts' *Zwischenstadt* covers scales – of transition and region - that are salient, the concept  
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15 is focused primarily on developed lands and on an interpretation of sprawl as a whole rather  
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17 than an understanding of interstices specifically. Third, it is apparent that a single interstitial  
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19 space could relate to or integrate more than one of these scales. A narrow infrastructural  
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21 interstice (a highway or railway) or a natural feature (a river or forest) could cover a wide  
22  
23 range of urbanized surroundings and connect several districts and have ramifications across  
24  
25 several scales, notably in terms of governance. An extensive open space could exist entirely  
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27 at one scale and within a single administrative jurisdiction posing few issues in terms of  
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29 governance. Fourth, figure 2 has limitations as a visualisation of interstitial spaces and speaks  
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31 largely to a monocentric metropolitan structure.  
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36 *Interstices of proximity* within suburbs define a first scale in terms of their closer  
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38 relation to the urban core or other existing urban fragments. This scale of interstitiality is  
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40 most clearly visible in monocentric cities and towns, whose most rapid urban expansion has  
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42 already passed, or in economically less dynamic urban systems. The set of possibilities  
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44 embraces the likes of parks, squares, protection's buffers and some restriction zones, local  
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46 services and infrastructure often in inner suburban locations.  
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49 *Interstices of transition* are those where un- or under-developed spaces help define the  
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51 character of contemporary urban expansion within a metropolitan system. At this second  
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53 scale, the 'interstitial territory' presents a multi-level issue for governance, implying a need  
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55 for coordination across different policy sectors and municipalities most commonly in a  
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3 monocentric metropolitan context. This is the case of metropolitan parks, military facilities,  
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5 zoos, industrial and research facilities, bigger restriction zones such as landfills and  
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7 brownfields, green protected areas or ecosystem features such as flood plains, valleys or hills.  
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9 Spaces such as Cerillos Airport can appear particularly relevant to the very largest  
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11 international developers and governments alike if they are of sufficient scale, well-located  
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13 and easily accessed (Silva, 2015, 2017). Less benignly they can be locations at which to  
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15 ‘dump’ social and environmental impacts near and beyond the boundaries of local  
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17 jurisdictions as we will see in the example of extraction sites across Santiago de Chile.  
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21 The spaces between different settlements as part of an urbanized region define a third  
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23 scale of the ‘*regional interstice*’ which implies a correspondingly wider coordination across  
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25 policy sectors and municipalities and a wide array of special purpose authorities related to  
26  
27 agriculture, industry, environment and public works. This scale perhaps pertains more to  
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29 polycentric urbanized regions and embraces vast areas between two or more independent  
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31 cities. This is the scale of interstitial space that Scott (2012: xi) sees having significant  
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33 economic potential in the cognitive-cultural economy where ‘restructuring effects in many of  
34  
35 the interstitial spaces between large cities ... significantly redefine what it means to be rural’.  
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37 These regional scale interstices appear important in the US but also in Europe such as in the  
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39 Randstad of the Netherlands.  
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43 *Interstices of remoteness* are the largest non-urbanized areas that lie between different  
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45 heavily urbanized regions. Most of the interstitial spaces defined at this scale are connected to  
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47 national planning policies and environmental designations such as national parks, protected  
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49 ecosystems and large geological and topographical features such as mountains, lakes,  
50  
51 estuaries.  
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54 The different scales at which interstitial spaces appear also have ramifications for  
55  
56 extant theories of urban politics. The smaller and often more constrained interstitial spaces  
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3 found at the scale of proximity are more likely to represent the piecemeal opportunities  
4 distributed within urban regime-style politics (Stone, 1989). For some of the reasons outlined  
5 by Phelps and Wood (2011), those larger and less constrained greenfield interstices found at  
6 the scales of transition and region are more likely to be subject to growth machine (Molotch,  
7 1976).  
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### 14 15 16 **Pending space: economic, social and environmental values adhering to interstices** 17 18

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21 Interstitial spaces have their own temporalities which rarely figure in extant theories of urban  
22 politics. Growth machine theory (Molotch, 1976), for example, speaks to situations of urban  
23 growth and rather assumes that the land development process continues unabated because of  
24 the coincident interests among local government and the private sector. However, even under  
25 conditions of urban growth, the competing economic, social and environmental values  
26 adhering to interstitial spaces ensure that some spaces – including the largest and most  
27 desirable to the private sector - can be pending for prodigious periods. This is certainly the  
28 case with the former Cerillos Airport site mentioned above where the continuing delay in the  
29 development of this prime site is partly attributable to a clash of urban models - between  
30 suburban ‘business as usual’ for developers and the opportunities perceived by urban  
31 planners for experimentation with new models based on global narratives of urban  
32 sustainability, smart growth and the like (Silva Lovera, 2015, 2017). Even in contexts of  
33 urban growth, recessions mean that numbers of interstitial spaces vary cyclically in the short-  
34 term, presenting opportunities for interim uses (Kamvasinou and Roberts, 2014). In contexts  
35 of urban shrinkage, the number of interstitial spaces will likely be in long-term increase. The  
36 impacts of temporary or interim uses on the empowerment of social groups, landowners and  
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3 planning policy as a result of both short-term and long term increases in numbers of urban  
4  
5 interstices should not be underestimated (Kamvasinou and Roberts.2014: 197).  
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8 Another case in point here would be three notable privately owned and operated  
9  
10 spaces of extraction activities in Santiago de Chile. Figure 3 shows a large site pock-marked  
11  
12 from the extraction of sands and gravels at the boundaries of the Maipú, Cerrillos and  
13  
14 Estación Central communes. Extraction in each case has dwindled to a now negligible  
15  
16 activity alongside some very minor construction-related activities in spaces that are classed  
17  
18 as industrial land but are effectively now interstitial spaces. As decaying or blighted spaces  
19  
20 they are nevertheless also 'pending' spaces framed by variable timelines over which they  
21  
22 may become developed in some form or other, not least because of the active attempts by  
23  
24 their owners to promote them for new development.  
25  
26

### 27 **Figure 3**

28  
29 The term *terrain vague* (Careri, 2002; Choay, 2003; Sola-Morales, 1995) emphasizes  
30  
31 the temporal ruptures in the urban fabric – the *pending* character of interstitial spaces.  
32  
33 Interstitial spaces at different scales are also subject to different temporalities in their  
34  
35 existence. The literature on fringe belts (Whitehand, 2001; Whitehand and Morton, 2004)  
36  
37 reminds us that the development of interstices can be pending over prodigious lengths of  
38  
39 time. That is, interstices appear inevitably as part of the sequencing of the development  
40  
41 process (Peiser, 2001: 282). Indeed, for Brighenti (2013: xvi), an urban interstice is a space  
42  
43 'surrounded by other spaces that are either more institutionalized and therefore economically  
44  
45 and legally powerful, or endowed with a stronger identity, and therefore more recognizable or  
46  
47 typical' (Brighenti, 2013: xvi). In this regard the past productive value of brownfield land  
48  
49 (Barnes, *et al.* 2001: 5; Yeh and Li, 1998; Hebbert, 1986) appearing as interstices within  
50  
51 urban sprawl has been recognised. Likewise the future potential productive and speculative  
52  
53 economic value of interstitial spaces of urban sprawl has often been highlighted in passing.  
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3 Farmlands appeared as 'pending lands' in the process of land conversion in the US (Clawson,  
4 1962: 102). Open spaces – perhaps as a function of leapfrog patterns of development - in  
5  
6 suburbs are actually central both to strategies by developers to increase the yields from  
7  
8 residential development (Thomas and Walsh, 1994) as Hovinen (1997) and Neuman (1997)  
9  
10 describe in the case of the US and Spain. They can also be important to residents in the  
11  
12 enhancement and maintenance of property values.  
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16  
17 These sorts of problems fall into sharper relief in developing countries where  
18  
19 economic asymmetries present difficulties in terms of balancing urban growth and service  
20  
21 provision. According to Ige and Atanda (2013) urban growth in developing countries has not  
22  
23 been driven by proportionate increases of services, facilities and efficient urban management.  
24  
25 Here urban sprawl has led to the presence of isolated, haphazard and incidental vacant spaces  
26  
27 with negative consequences for, and degradation of, the urban environment, such as informal  
28  
29 occupations, scenes of uncollected garbage and the infilling of vacant spaces and parks or  
30  
31 other encroachments (Ige and Atanda, 2013: 29). The aforementioned description draws a  
32  
33 picture of interstitial spaces as 'unexpected' negative externalities where the urban growth  
34  
35 machinery produces outcomes as part of regulatory processes that are asymmetrically  
36  
37 disposed towards economic development.  
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42 However, the pending nature of interstitial spaces is also registered in their latent  
43  
44 social, environmental or ecological value. Brighenti (2013) focuses significantly on the  
45  
46 possibilities presented by urban interstices for the mobilisation of minority populations and  
47  
48 interests. Gandy (2009) used the term 'interstitial place' to define areas inside the city as  
49  
50 'wild' lands fully charged of natural characteristics and repositories of information that  
51  
52 encompass micro-climates, flora and fauna and geology. Gandy stresses their potential when  
53  
54 noting how they: 'reveal a city within a city that is not stage-managed for tourism or  
55  
56 consumption but open to multiple alternatives; a network of unregulated spaces between both  
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3 ecological and socio-cultural diversity can flourish' (Gandy, 2009: 152). He has since gone  
4  
5 on to define these unintentional landscapes as involving 'an aesthetic encounter with nature  
6  
7 that has not been purposively created' (Gandy, 2016: 434).  
8

9  
10 Yet the pending character of interstitial spaces is also something that has important  
11  
12 ramifications for a grassroots politics of collective consumption. In Germany, for example,  
13  
14 the temporary or interim uses of the vacant sites – or *Zwischennutzungen* – that have  
15  
16 proliferated with urban shrinkage are dependent on a new urban politics (Dubeaux and Sabot,  
17  
18 2018). In this way, urban interstices are spaces to be appropriated as new commons for new  
19  
20 social practices (Stavrides, 2014). Yet they can also be revealing of important fissures that  
21  
22 can exist *within* the politics of collective consumption (Castells, 1977) - a subject that urban  
23  
24 political theory has perhaps been slow to acknowledge. Interstitial spaces can be the subject  
25  
26 of competition between different collective consumption needs. Gottlieb (2007: 54) notes  
27  
28 how the remaking of nature in the vacant spaces of Los Angeles has also rubbed up against  
29  
30 desires to use such spaces for other collective consumption needs such as schools, social  
31  
32 housing and waste treatment facilities.  
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### 38 **The planning and non-planning of interstices**

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43 The physical, legal, planning and regulatory characteristics that shape the pending nature of  
44  
45 interstitial spaces of urbanisation suggest that interstitial spaces are the deliberate result of  
46  
47 'corporate and institutional reserves' (Northam, 1971). Yet, in other instances, urban  
48  
49 interstices appear as the unexpected outcomes of planning.  
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51  
52 On the one hand, some interstices are the expected outcomes of the planning process.  
53  
54 Vacant lands present important environmental properties within the whole process of urban  
55  
56 expansion but there are substantial contrasts in this role across a range which encompasses  
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3 city centres, inner suburbs outer suburbs and peri-urban areas (Douglas, 2008). Most green  
4  
5 spaces in inner city and inner suburban locations are protected and seldom changed (private  
6  
7 gardens, private community squares, or small parks nearby). Yet, brownfield interstitial  
8  
9 spaces in the same inner city locations may be subject to planning ‘blight’ despite their latent  
10  
11 economic value. Here any growth machine logic is one in which local and national state  
12  
13 expenditures rather than purely private interests may come to the fore (Phelps and Wood,  
14  
15 2011). The ‘rent gap’ associated with derelict or unused land and properties (Smith, 1982)  
16  
17 may not close without planning intervention (to clean up or provide access to sites) and even  
18  
19 then may necessitate an urban politics and planning permissive of informal, temporary or  
20  
21 interim uses where decline is prolonged (Dubeaux and Sabot, 2018). In the outer suburbs and  
22  
23 peri-urban areas, more land-use change occurs mainly because ongoing development  
24  
25 pressures are more intense. Here development may proceed and open spaces disappear due to  
26  
27 the conversion of remaining raw land into developed land for the first time. While nature is  
28  
29 often uprooted with vegetation removed or new species imported, the green spaces that are  
30  
31 left or which were created in the development process will also retain a value in terms of their  
32  
33 potential biodiversity and their ecosystem services (Douglas, 2008: 1113).

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38 Interstices are planned as ‘open’ in order to sustain its environmental properties,  
39  
40 create security zones or to create public spaces at different scales. These are the cases of  
41  
42 green corridors, security buffers, parks and squares. These ‘vacant’ lands are expected to  
43  
44 provide positive externalities and often are secured under planning regulations. In this  
45  
46 context, architects and designers have designated open spaces as ‘buffers’ between different  
47  
48 incompatible functions such as industries and residences, for instance. Yet, in this way Talen  
49  
50 (2013) argues American zoning contributes to sprawl, since open spaces seem to be randomly  
51  
52 distributed over the area of urban expansion, not because of their potential as public places  
53  
54 but rather because of the importance of several previous infrastructures: ‘There are many  
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3 examples of this phenomenon, such as residential zones adjacent to eight-lane freeways, and  
4  
5 public amenities surrounded by low-density, single-family zoning. In most cases, a more  
6  
7 appropriate spatial pattern would put open space or more resilient uses adjacent to freeways,  
8  
9 and higher-intensity land uses adjacent to public amenities' (Talen, 2010: 179). Thus, open  
10  
11 areas are also 'planned' as vacant lands for absorbing impacts and protecting new  
12  
13 development; the emptiness of these buffers is defined in their roles as urban containment  
14  
15 mechanisms.  
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18  
19 On the other hand, interstices can appear unplanned as the unexpected outcomes of  
20  
21 planning systems, produced as a consequence of the appearance of other developed areas,  
22  
23 economic constraints, geographical handicaps or declines in the market value of land and  
24  
25 properties. This is the case of empty spaces between two large scale residential  
26  
27 neighborhoods, derelict areas, a flood valley or brownfields which have been left inside the  
28  
29 urban territory with its expansion. Often these spaces are encroached on by informal activities  
30  
31 and might be viewed as negative externalities. Private sector inertia contributed greatly to a  
32  
33 'paradox of extreme land vacancy coexisting with supply constraints in inner urban areas'  
34  
35 (Adams, Russell and Taylor-Russell, 1994: 14) in land coming forward for industrial  
36  
37 development in the Wirral area of the UK in the 1980s. Here, planning was not the main  
38  
39 constraint on the development of sites while planning authorities as land owners were often  
40  
41 more active in bringing forward sites for development than private sector owners.  
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#### 45 **Figure 4**

46  
47 Interstitial spaces appear unplanned to the point where architects, urbanists, planners  
48  
49 and other professionals work on them in an attempt to fill and stitch them together with new  
50  
51 forms of order (Matos, 2009: 63). Indeed, paradoxically, they may represent those spaces  
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53 within the urban fabric most free from authority (Careri, 2002). In this light, the planned  
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55 condition of interstitial spaces often emerges as a matter of revamping in order to host  
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3 flagship developments in which success rests on urban design practices and politically-  
4 oriented regulations that reinforce them. The revamping process of a former large-scale  
5 suburban interstice in Santiago de Chile defined by a former airport has been all about urban  
6 design issues and morphological patterns as tools to integrate the area into the surrounding  
7 urban fabric. However, the unplanned framework for decision-making has left design  
8 procedures in a long-standing stalemate in which politics pervades all aspects of the efficacy  
9 of planning approaches (Silva, 2015, 2017b). Curiously, as a result, this intensely planned  
10 interstitial space still projects an image of desolation (see figure 4).  
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21 Finally, some of the major ingredients of sprawling suburban landscapes, although  
22 planned and although apparently placeless, have had unintended or unanticipated  
23 consequences. ‘In the same way that many organizations change or grow as a result of their  
24 own eccentricities, the production of spatial commodities is fuelled by mistakes and risks’  
25 (Easterling, 1999: 4). The generic production of spatial commodities that Easterling is  
26 referring to concerns mass suburban housing but also the likes of highways and other  
27 infrastructure which signal the relational properties of some interstices – a subject to which  
28 we turn now.  
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#### 40 **The relationality of interstices**

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45 Interstitial spaces are revealing but paradoxical sites of relationality. Not only are urban  
46 interstices less relational than they might be when the infrastructures associated with these  
47 spaces are discrete and non-connecting (Easterling, 1999) but those infrastructures can also  
48 interrupt the erstwhile relational potential of adjacent built spaces and communities  
49 inhabiting them. Moreover, the relational potential of urban interstices exceeds the territorial  
50 purview typical of extant theories of urban politics.  
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3 As infrastructure-rich spaces, interstices have been considered prime instances of  
4 placelessness (Relph, 1976: 90). These non-places can be quantified ‘by totalling all the air,  
5 rail and motorway routes, the mobile cabins called “means of transport”’ (Augé, 1995: 79).  
6  
7 The heightened mobility associated with such infrastructures can appear ‘to involve a number  
8 of absences – the absence of commitment and attachment and involvement – a lack of  
9 significance’ (Cresswell, 2006: 31). Yet, in contrast to the absences that might be associated  
10 with infrastructures of mobility, Vidal’s discussion of the interfragmentary spaces made up of  
11 infrastructure networks highlights their relational properties. This property of inter-  
12 fragmentary space is one that results from of an overlapping between fragments, the suturing  
13 of urban fragments and the creation of networks of action (Vidal, 2002: 152). Vidal defines  
14 the ‘inter-fragmentary space’ of networks for cases of urban fragments which are physically  
15 separate but connected by lines, channels, mains, pipes and other elements concerned with  
16 promoting movement.<sup>4</sup>  
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### 32 **Figure 5**

33  
34 The commune of Pedro Aguirre Cerda within the metropolitan area of Santiago de  
35 Chile has several infrastructural interstices that appear at its boundary. These interstices  
36 emerge as physical divisions and restricted areas and although this intensive provision for  
37 mobility might signal significant regional economic potential, it nevertheless is perceived as  
38 negative because these spaces do not afford easy access to pedestrians and to nearby  
39 employment sites. Moreover, in extreme instances, such as seen in figure 5, the network  
40 attributes of these interstitial spaces can be seen to contribute to their indeterminacy - since  
41 infrastructure components can describe different degrees of functionality and effectiveness  
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52 <sup>4</sup> Vidal (2002: 157) points out that ‘physical distance is not a *sine qua non* condition for  
53 network creation; a communication-net could be used to join fragments even when one is  
54 beside another, but the interchange is disrupted by an intermediate element. This is the case,  
55 for instance, with two neighbourhoods detached by railway facilities but connected by  
56 telephone lines, a footbridge, a tunnel or a bridge’.  
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3 coexisting in the same interstitial space. The motorway, for instance, might be seen as an  
4  
5 efficient and modern infrastructure coexisting with the now less functional railway as the  
6  
7 heritage of the former prime mode of transport of commodities. These two share an  
8  
9 interstitial space in which a polluted canal is used to evacuate industrial residues but hardly  
10  
11 offers a safe, let alone amenable, artery for connection.  
12  
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14 The term green infrastructure carries with it a sense of how interstitial spaces are  
15  
16 forces for the integration of urban territories. The network infrastructural properties of the  
17  
18 interstices of urban sprawl are also implicit in Sieverts' emphasis on the conflicts over major  
19  
20 public works in the *zwischenstadt*. Indeed, Keil and Young (2011) and Young and Keil  
21  
22 (2014) have used the concept of *zwischenstadt* explicitly to draw attention to the expanses of  
23  
24 in-between suburban landscapes which are crossed by infrastructure. These places, traversed  
25  
26 by roads, are also potential expansion areas (Keil and Young, 2011: 9). Yet their relational  
27  
28 properties are rarely fully mobilised. The vulnerabilities of populations of in-between cities in  
29  
30 the Canadian case have been produced 'by the failure of conventional political spaces and  
31  
32 processes to capture the connectivities threaded through those places that are in-between the  
33  
34 centre and exurbia' (Young and Keil, 2014: 1590). Here it is as well to remember that 'the  
35  
36 spatial imaginary of land use planners remains largely bounded within their own municipal  
37  
38 territories, contra the global talk that characterizes most discussions of logistics and  
39  
40 distribution' (Cidell, 2011:845).  
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## 47 CONCLUSION

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51  
52 Fragments of writing found notably in architecture, art and literature studies and, to a lesser  
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54 extent, urban sociology, planning and geography focus on interstitial spaces explicitly but  
55  
56 often for quite particular purposes. Here we have incorporated their insights into a research  
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3 agenda that hopefully resonates across the broader field of urban studies. First, many of the  
4  
5 existing terms that speak to urban interstices are suited to analysis at particular geographic  
6  
7 scales. We therefore proposed a definition of the term interstitial operative at different  
8  
9 geographical scales. For the purposes of analysing the un- or underdeveloped spaces that  
10  
11 necessarily are part of urban sprawl in particular, we drew attention to two scales as the most  
12  
13 pertinent: the interstices of transition and interstices at the urban regional scale. Second, the  
14  
15 interstitial spaces of urban sprawl are not inert. They are comprised of a wide variety of uses  
16  
17 and activities. Consideration of the function of interstitial spaces is well covered in the extant  
18  
19 literature and we focused instead on important meanings attached to, and forces operative on,  
20  
21 interstitial spaces. Interstitial spaces can be read in terms of historical processes which render  
22  
23 them pending. Such potentials are most obvious with regard to the economic interests at play  
24  
25 and that most forcefully suggest the inevitability of their transition to developed land.  
26  
27 Nevertheless, there can also be important environmental, social and political meanings and  
28  
29 potentials invested in such spaces. Some of these have come to the fore in the remaking of  
30  
31 urban nature (Gottlieb, 2007) and the politics of collective consumption. Third, the potential  
32  
33 of interstitial spaces is apparent regardless of whether such spaces are regulated or not.  
34  
35 Planning policies and regulations ensure a degree of permanency and functionality of *some*  
36  
37 interstitial spaces. Paradoxically, however, planning and regulation of land use can lend the  
38  
39 appearance of urbanisation being unplanned. The term 'planning blight' suggests not an  
40  
41 absence of planning but the vulnerabilities of planning processes to economic and political  
42  
43 cycles. Fourth, to the extent that the term interstitial space can encapsulate *relationships*  
44  
45 between spaces within urban sprawl it may also prove to be an integrative term. It can serve  
46  
47 to integrate discussion of both the developed and un- or under-developed spaces that  
48  
49 compose the urban; the infrastructures and regulatory activities and designations that link  
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3 both; the economic, political and social groups that occupy, identify with, and seek to operate  
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5 upon both.  
6

7  
8 This agenda highlights the value of integrating insights from different disciplines of  
9  
10 the built environment. The literature on fringe belts and expansion zones figured prominently  
11  
12 at one time in geography. The work of planners provides important insights into the effects of  
13  
14 regulation on the scale and pending nature of interstitial spaces. The ideas of *zwischenstadt*  
15  
16 and interfragmentary space promoted by architects have drawn attention to the regional and  
17  
18 architectonic scales at which interstitial spaces are apparent and their relational properties.  
19  
20 Politics, as we indicated in the examples drawn from Santiago de Chile, is never absent from  
21  
22 the fortunes of urban interstices and as such the four themes around which we organised our  
23  
24 discussion each have implications for extant theories of urban politics.  
25  
26

27  
28 In this latter regard, interstitial spaces are ones that speak to scalar *and* relational  
29  
30 ontologies of the urban. It may even be more apposite to ask the question ‘whose city?’ of  
31  
32 interstitial spaces given the competing interests surrounding them. Interstitial spaces highlight  
33  
34 the inseparability of analytical perspectives and normative agendas on urban dynamics as  
35  
36 much as the built environment. The susceptibility of interstices to both scalar and relational  
37  
38 ontologies call for the development of theories of urban politics beyond the city or the urban  
39  
40 as a single undifferentiated unit.  
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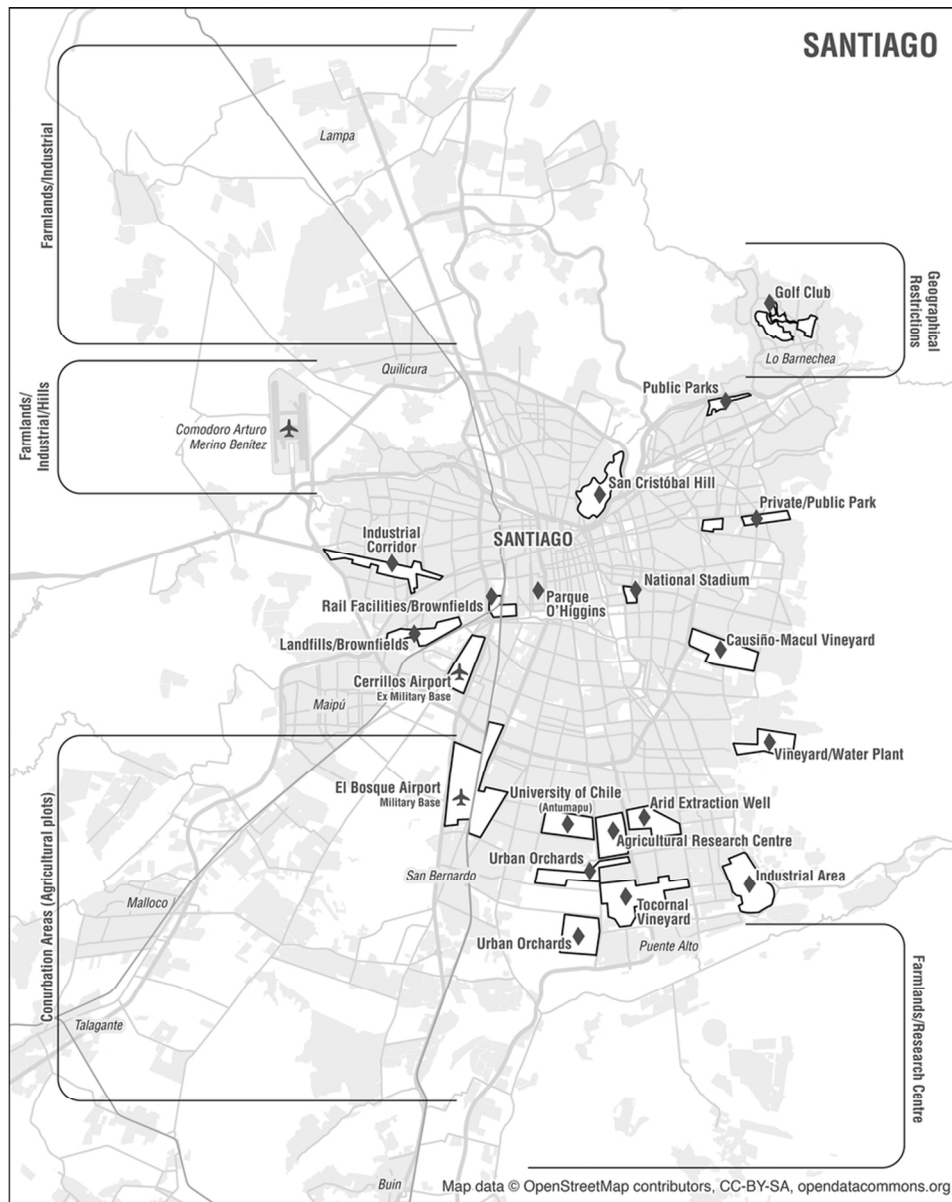


Figure 1

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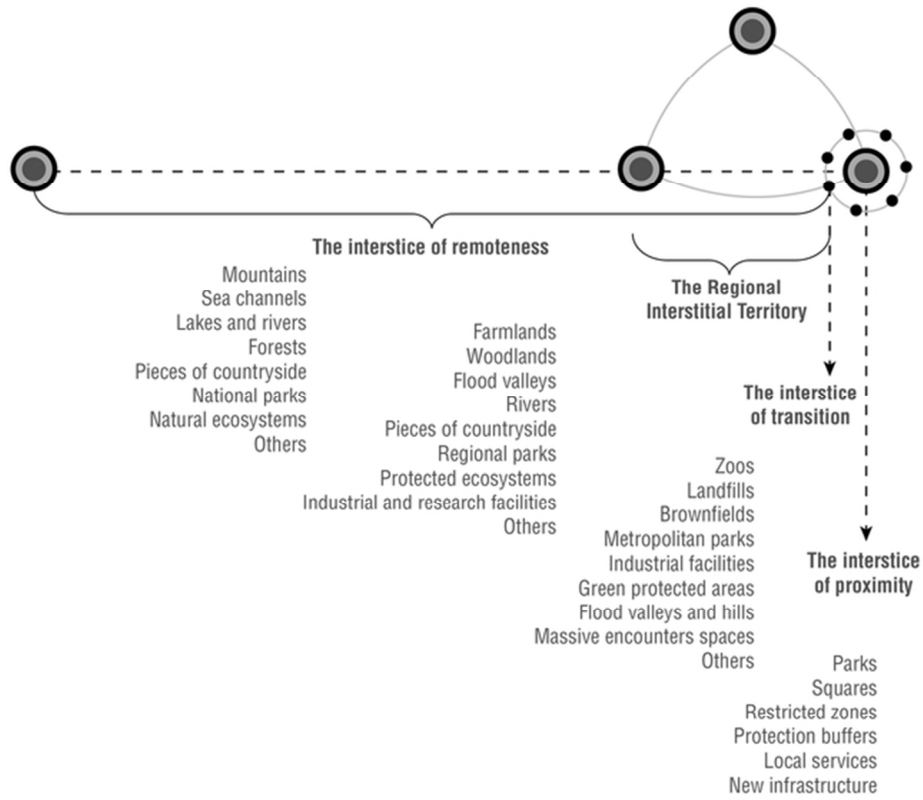


Figure 2

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**Figure 3. An extraction site in the commune of Cerrillos**

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**Figure 4. Forlorn urban design elements at the site of a former airport in the Cerrillos commune**



**Figure 5. Different networks mingle at the boundary of Cerrillos and Pedro Aguirre Cerda communes**