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Contents

The Question of Metropolitan Form: An Introduction

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Posing the concept of 'metropolitan form' as a question, as in the call for papers for this issue of *Footprint*, is an absolute necessity at this stage of development of urbanized areas. Many of the papers in this issue begin with the straw-man notion of a formless agglomeration of activities and spaces, the - for lack of a better phrase - postmodern urban experience.[1] There is a persistent theme in the related literatures of architecture, urban design and urban and regional planning that the physical form of the contemporary metropolis is un-describable. Soja's six metaphors (post-Fordist industrial, cosmopolis, expolis, fractal city, carceral archipelago, simcities) are being indicative of the wide range of possible images.[2] The eight papers in this issue of *Footprint* take an opposite approach. They begin to trace the contours of the debate around how the noun 'metropolitan form' might be understood, how it might be studied, and how it might be possible to move from an empirical understanding of its structure to more intuitive design solutions.

What metropolitan form is depends of how we see! Asking the question of 'metropolitan form' requires almost the opposite set of lens that is required to ask questions of microbiology and/or nano-technology. We certainly cannot see with the naked eye the 'over-expressing of cyclooxygenase-2 into MCF-7 tissues' that causes a certain form of breast cancer or the wavelets that we may design to create desired effects in electromagnetic force fields. Yet they exist, have definable processes, perform vital functions, and yield structures or form. The same is true for the urban region. Thierstein and Forster's *The Image and the Region* is a call to arms to make the urbanized region visible to academics, politicians, citizens, and administrators.[3] It might be true that the only way we can see the urban region is from a map (maybe) or from space using technologies like aerial photography or Google or Microsoft mapping techniques.

The World Bank examined the dynamics of global urban expansion by focusing on a sample of 120 urban regions.[4] The heart and soul of these representations are what could be called 'big red blobs'. The study group created a number of measures of the 'form' of these regions including: the buildable perimeter expressed as a percentage; a contiguity index; and a compactness index. In a similar manner, Simmonds and Hack used a measure of compactness (defined as the ratio of the actual perimeter of built- up areas divided by the theoretical minimum perimeter, represented by the perimeter if a circle containing the equivalent developed area) in their landmark study of emerging forms in eleven global city regions.[5] These are clearly aggregate measures of some sort of 'form'.

Measures of gross area form are not enough. The World Bank study poses a number of interesting questions. Using the Mumbai example, what is the Mumbai 'big red blob'? What it is not is the City of Mumbai nor the Mumbai Metropolitan Region. It is, for the lack of a better term, the urbanized region [of Mumbai]. Further analysis using administrative

or census data would reveal that this 'big red blob' is actually five municipal districts that over-bound the metropolitan region. Second, the World Bank map differentiates only between 'urban' and 'rural' land uses. While useful to relate to the land cover and general urbanization literatures, it only marginally speaks to those interested in the internal [territorial] organization of such places. For example, Figure 1 would not reveal that Mumbai has three 'downtowns', clearly differentiated by function and purpose.[6] The global city regions examined by Simmonds and Hack are analyzed in terms of economic, social, geographic, infrastructure, and governance attributes.

One might argue that to know 'metropolitan form' is to be able to measure 'metropolitan form'. Unfortunately, with the exceptions noted above, there is not a lot of literature or examples to draw from, that study form at the metropolitan scale rather than at some other scale (the most common being the 'urban' scale). For example, Clifton et al. provide an extensive literature review on the measurement of 'urban form'.7 Clear from that review is that approaches - and scale of analysis - to knowing are disciplined-based: landscape ecologists and economists tend to begin their quest at the metropolitan scale, urban designers and community development researchers begin their quest at the more micro scale. On the other hand this, otherwise thorough, review ignores questions of internal regional economic spatial structures and political organization and administrative structures. In some quarters, the debate is not whether an urban region is monocentric or sprawled, but precisely how polycentric it is.[8] Thus, even if we equate 'metropolitan form' with 'urban form', which we should not do, the current status of our knowledge is, indeed, limited.

A final pre-amble thought is the related question of whether urbanized regions can be designed. Clearly, metropolitan regions have been the subject of a plethora of work in a multitude of disciplines, ranging for example from the Simmonds and Hack study of global city regions (from the perspective of the urban designer) to Salet, Thornley & Kreukel's study of metropolitan governance (from the perspective of the institutional planner).[9] What is especially interesting is that in both cases the quest for overall understanding is abandoned when questions of design come up. Simmonds and Hack answer the question of what to do by stating the need to focus on the micro-scale; Salet and his colleagues reach the conclusion that there are no universal design principles for the governance of metropolitan action spaces. Despite these heroic and thoughtful studies, it appears that the state-of-the-art of and the hope for understanding seem to be a return to the local and the specific.

Thus, the quest continues. It seems that a general theoretical model is needed: one that merges the disciplinary biased approaches of landscape ecology, intra-regional economic structure as expressed in the built environment, and governance structures. Prosperi, Moudon & Claessens have previously suggested that a new epistemology and a new language are needed for the question of metropolitan form.[10] Perhaps what is needed most is a re-write of Moudon's 'catholic' paper; but this time written with the urbanized region as object.[11] The quest for description, designing, evaluating, and/or understanding the urbanized region is an exercise in abstraction. Like the scientists studying the human brain, we know the object exists but do not yet know how it works. The task is to discover its functioning, in terms of both processes and resultant structures. Set diametrically opposed to the post-modern haze of what the contemporary metropolis looks and feels like is the work of the 'scientists' - those invoking the need for an object to study,[12] complexity,[13] design as science,[14] or even the planners with an emphasis on infrastructure and technology.[15]

The papers in this issue of *Footprint* represent meaningful steps in the development of an empiri-

cal basis for the study of metropolitan form. The eight papers cover the gamut from descriptions of the physical manifestation of metropolitan areas in China, Latin America, and Europe through the quest for meaningful projects that 'fit' within the metropolitan context, to the development of ideas about what 'metropolitan form' might mean from the perspective of the thinker/practitioner.

Six of the eight papers are directly focused at the scale of the urbanized region. The approaches, however, are wonderfully and provocatively different, yielding a host of new potentially (in the eventual sense of design) insights. Yet, there are at least four themes that re-occur throughout these papers. *First*, it is possible to conceptualize urbanization at the scale of the metropolitan region. Furthermore, it is possible to do so from several different perspectives – landscape ecology (DeWit, van der Velde & Steenbergen), regional economic polycentricity (Fernandez-Maldonado, Romein & Verkoren), and politically/administratively (Çalkiskan). *Second*, the idea that metropolitan form is in a constant state of emergence, with influences coming from both government policy and infrastructure. The study of Ankara (Çaliskan) demonstrates how national planning priorities influenced the core-periphery relationship since the 1930s through the mechanism of formal plans. Similarly, the papers on thinking about Amsterdam (Read) and the role of movement technologies in Beijing (Sheng and Han) demonstrate how the dominant mode of transport changes and changes the legibility to the urban region. *Third*, the theme of decentralization of both economy and housing is evident in the papers about Beijing (Zhou and Lei), Ankara (Çaliksan) and Latin America (Fernandez-Maldonado, Romein, and Verkoren). The Latin America paper poses a particularly interesting question: is this polycentric structure of metropolitan regions truly universal? *Fourth*, the papers demonstrate a willingness to assess contemporary theory of urbanization at the scale of the urbanized region. Fernandez-Maldonado, Romein, and Verkoren examine how polycentric development in terms of employment might be a universal phenomenon. Sheng and Han evaluate how 'central flow theory' (based on Castell's space of flows) might improve Christaller's central place theory (based on more traditional transport models). Perhaps the most interesting point here is Read's assertion that these 'spaces of flows' have actual physical manifestations within urbanized regions. The 'creative computer flow modeler' will, in the end, know *where the server actually is*. Thus, that elusive (and not very described from a physical sense) 'knowledge economy' may indeed have a physical manifestation.

Two papers explore the relation of individual projects to the question of metropolitan form (Furtado, Stoppani). How is the practice of the designer related to the overall spatial structure of the region? Simmonds and Hack come to the interesting conclusion that since regions cannot be designed (even by strong governments, with lots of infrastructure money), the best that we can do is to work at the local level.[16] This supports the usefulness of the recent literature on megaprojects and/or strategic urban projects.[17]

These two papers also examine attributes of 'form' as the basis for individual projects. Faced with the inevitable presupposition that there is neither an object to be designed[18] nor a 'form of form' against which to judge,[19] the papers look at design concepts with which to approach the question of metropolitan form. These papers belong to the intellectual infrastructure of the urban design canon - the collection of ideas and concepts that give rise to the project. Furtado makes clear the relation of the work of Sola-Morales to the postmodern school of Soja and colleagues. Stoppani reviews the city of Piranesi.

In conclusion the question of 'metropolitan form' remains a question, amenable to inquiry from approaches of both science and intuition. Intuition

remains critical, but science will eventually lead to firmer (and better?) understandings of the dynamics of metropolitan growth, function, and form. As Lehrer reminded us in 2007, Proust was, after all, a neuroscientist! And, as Batty warned us in 2005, it has taken us almost 50 years to come to grips with Jane Jacobs' 'complexity' and it may take another 50 years before we get close to understanding those magnificent things we call urbanized regions.

Notes

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Another Form: From the 'Informational' to the 'Infrastructural' City

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The Bifurcated City

How do we characterise the form of the contemporary city? Towns and cities used to be delimited by walls and centred on cathedrals or citadels or plazas. They were a sort of meta-architecture, centring the power of a ruler or church, or sheltering a market or a public place with its politics of exchange, appearance or talk.[1] They commanded a region of smaller towns or a rural extension that filled the space to the next town or city.[2] The legibilities of citadels, spires and boundaries still inform more recent images of a world of compact cities with CBDs neatly bordered by belts of neighbourhoods interspersed with industry and surrounded by open space. In this image that still sits so powerfully in our expectations, urban systems consist of hierarchies of villages, towns and cities, each with dominion over successively larger territories.

This comforting image is shattered today however as new movement and communications infrastructures cut through neatly spaced territories, undermining hierarchical orders and bringing incompatible urban elements into incongruous relations with one another. Today, communications and social and economic organisation shift into cyberspace in a logic of hypertext as people break free from the constraints of place, to work and make community in networks across regional and even global dimensions. The internal orderings of cities seem to have become irrelevant, and the city has responded apparently by scattering. The rural peace is shattered as urban people spread into the countryside, to be followed by the rest of the city including its most central components. A new amorphous city of fragments has invaded everywhere, creating sprawls of low intensity urbanisation served by ribbons of traffic-clogged infrastructure. Without having explicitly intended to do so, we seem to have created a new regional urbanism without community, public space or centrality, without *places* in the way we are used to understanding them.

This loss of place has been signalled for a long time: Melvin Webber proposed already in the 1960s that we were beginning to conduct our lives in 'non-place urban realms' engaging in 'communities without propinquity' over different ranges by means of new travel and communications opportunities.[3] He proposed however that our loss of places was not simply a loss of order or a failure of planning, but something positively brought into being as we made new forms of communication, social organisation and exchange possible. Marc Auge pointed to the downside, and bemoaned the loss of an organic social life in a supermodernity that has separated itself from the rest of the world in a self-contained space of long-distance connectivity.[4] These twin themes have remained with us: of on the one hand the integration of new placeless forms of society by technological means, and on the other of the consequent fragmentation of social worlds as previously organic societies are divided by being included in or excluded from the new mobile, globally integrated world.

Much commentary today understands a new social order emerging in a more virtual, less real, space and sphere.[5] This space is high-tech, with high-tech networks and media and mobile personal devices facilitating new virtual forms of social and economic life free from the gross reality of life at street level. This new space allows some to inhabit not so much a global village as 'a global network of individual cottages'.[6] It understands a world divided between an 'organised core of professionals and managers and a disorganised periphery' occupying respectively 'the nodal segments of the space of globally interconnected flows and the fragmented and powerless locales of social communities'.[7]

A Material-Communicative Form?

I will argue here that this view undertheorises the network organisation in the physical places of cities. I will extend the role of communications or relations to things and the low-tech as well as to the high-tech and people, to the materiality of places as well as to cyberspace. In doing so I will argue that action at all levels, rather than just the high-tech level is made coherent by and integrated in technical systems which create bounded 'technological paradigms'[8] of objects, subjects and practices. In a contextual world, things and ways of doing things are given in their combinations with other things and ways of doing things, so that they can only be what they are and make the sense they do in drawing their significance from what is around them. Things come in whole arrangements in other words, and these arrangements need to be assembled and maintained in order that meanings come to be and remain stable. Peter Taylor has asserted that cities come in packs[9]; I am saying that *all* urban entities, cities, neighbourhoods, buildings, street furniture or big-box out of town stores, are organised in networks of related entities. We only recognise them for what they are in their relations or networks and would feel them out of place outside of them.

The question of how things remain together in arrangements is of course a crucial one, but one that is simple to answer. There is a material basis to the meaning and significance of urban entities in being with other entities, and in order to be durably what they are, they need to be held in place in synthetic and *realised* arrangements, in what I will call 'infrastructures'.

Many have argued that technology and relationality have played a central role in forming our subjectivities and making us who we are. Here I will suggest that also the *objectivity* of the city is constituted in limited technical systems or infrastructures comprising complexes of arranged things. I have covered some of this ground in a previous paper where I explored the relationality in Heidegger's thinking. I proposed that in reading Heidegger we have to move beyond considerations of technology as something to be simply used or read and as exterior to human life. We need instead to consider it as implicated in perception and practice and central to the way objects and subjects are disclosed.[10] The so-called perception-practice paradigm, understands that facts and things have a genesis and develop, rather than being simply there and discovered. They are 'inseparably connected with … techniques … interpretations and … conventions' and dependent 'on "conjunctures" …'.[11] Facts, things and ideas belong together, are produced, and co-constitute one another in 'paradigms'.[12] In such a view the emphasis is on context, co-production and 'thick description',[13] to reveal processes of disclosure, rather than on straightforward definitions and descriptions of facts.

Infrastructures, as I will use the word here, are technical networks arranging and especially *distributing* things and practices that have and draw their significance in relation to one another. But infrastructures are more than handy resources held in convenient relations with other things, because the things they contain are not predefined but become defined and come to make the sense they do in relation to whole

arrangements of subjects, objects and practices that work together to construct larger entities - like the neighbourhood or the modern city or the metropolitan city or the globe for that matter. Infrastructures are also arrangements constructed and realised in specific historical times and conditions and to the social-organisational and technological state of the art of their times and places. They establish practical and of-their-times ways of knowing and doing things between and in the presence of other things. In this way I want to foreground the role of technological materiality in the production of urban things while conceiving subjectivity as a form of practical engagement with that materiality.

I will look at the way infrastructures of contextual entities and practices are established and will cover a few examples, starting with a new virtual global informational network and practice, and then moving on to the less topical but just as significant real historical example of the modern city. The metropolitan post-modern city will be by then rather simple to describe. I will suggest that in a relational perspective all our infrastructures, and the subjects, objects and practices that attach to them, are both real in that they do something and virtual in that they are synthetic and potential, requiring active engagement before they manifest themselves. I am interested here in exploring how this point of view might change the way we look at and think about the urban periphery and the contemporary diffuse city. While a different way of seeing things may not solve problems we see emerging with new urban forms, a conceptualisation that finds order in the phenomenon we are looking at may offer at least some clarity about what it is we are dealing with.
By in a sense virtualising urban materiality I will suggest that we may be able to reunify an urban space bifurcated between the virtual and the real and make places and flows commensurable. I will also suggest that in making real and virtual (low and high-tech) networks commensurable we can start to move beyond categorical dualisms like real and virtual or mind and material and as designers and planners begin dealing with the city directly in terms of the material technological paradigms of infrastructures. We live not in a bifurcated space but in a 'dappled world'[14] of our own making and replete with boundaries and cross-paradigm articulations. In the view I will outline our post-modern city is in principle no more or less ordered and coherent than any of the others, but what I will suggest is that in order to tackle problems of change and transition we need conceptualisations which enable us to see the boundaries and articulations clearly.

The Informational City

But first I will look at a form of contemporary social and urban organisation in the terms in which it is normally discussed, questioning the notions of information and subjectivity used. I will oppose this 'informational city' to the idea of the 'infrastructural city' and suggest that the first misses the role of a communicative materiality in the order and production of cities.

According to a well-known informational view of the social-organisational form of our world, urban space has shifted away from being a social text,[15] in a serial sequential time, to being a hypertext of simultaneous, technologically enabled, social-organisational linkages. Manuel Castells has claimed that the new microelectronic communication media constitute a radically new 'technological paradigm', and that the new 'informational city' is a product of this new technology and the organisational structures it enables.[16] The power of networks today has become such, according to this view, that it is possible for the first time to coordinate and facilitate networked, decentralised organisation and action and maintain synchrony in networks.[17]

This new society is of a communicative order that emphasises the individual and his or her relations with widely distributed people in sparsely connected 'network communities' of family, friends, workmates

and business contacts. Each person constructs his or her own community to orders relevant to that individual, and the internet becomes the pre-eminent infrastructure for a 'networked individualism'.[18] We begin to conduct large parts of our lives in a pervasive connectivity of diverse network systems, and in a culture of 'real virtuality'.[19] Castells claims that this translates as a transformation of the material conditions of our lives, through the institution of a 'space of flows' and 'timeless time'. The space of flows refers to the technological and organisational possibility of effective social practices without geographical contiguity; timeless time refers to the use of new technologies 'in a relentless effort to annihilate time'.[20]

But is this vision of a free-forming networked individualism weightlessly inhabiting a global space too simple? What kinds of people and things are involved in his vision? Castells has a Weberian conception of power as a violence someone does to someone else, defining power as 'the action of humans on other humans to impose their will on others, by the use, potential or actual, of symbolic or physical violence'.[21] He sees power as being played out today less through physical and more and more through symbolic violence - through media and communications - and he sees the subject emerging in this struggle, which is a struggle in his terms literally for minds.[22] Communications technologies and media are the most important parts of our lives today because 'they build our imaginary'.[23] While acknowledging that the power of global media today is unprecedented and may be radically and violently transformative of power relations, I want to note that Castells's conception of the subject and his or her constitution is importantly different to more embodied versions of the constitution of subjectivity, and some of this is precisely in the emphasis on minds.

Although he notes Foucault's emphasis on the bodily microphysics of power, Castells stays with his macrophysics of networks of globally connected minds and globally diffusing ideas. Foucault argued how, in relations of power, human subjects are moved to behave in certain ways without being forced: 'The exercise of power consists in guiding the possibility of conduct and putting in order the possible outcome. Basically power is less a confrontation between two adversaries or the linking of one to the other than a question of government'.[24] He taught us that we are shaped in situations that shape our conduct: being a crew member on a ship or a member of a household fundamentally affects the ways we are and what we do. We are all subject to an invisible governance of rationalised schemes, institutionalised programmes, techniques and material apparatus that shape conduct to particular ends.[25] These technical-organisational 'devices' diffuse more slowly than ideas, are integral with, and often only make sense in the context of, the practices they support and enable, and are not at all easily thrown off or replaced.

With Foucault we shift the locus of subjectivity and action from the agent to the agent-environment relationship. What acts is not simply the agent with his or her stock of ideas, but the agent integrated with the technical and organisational systems that enable the action and make it coherent. What we end up dealing with is not pure ideas or information but dense networks of diverse but interrelated people and material embodying practical knowledges and supporting practices embedded in place.

Networks of Knowledge

Ole Hanseth points out that even if we could regard knowledge as composed of pure information we would still have to contend with the systematicity of knowledge itself - the fact that bits of information may only make sense in a very restricted number of combinations with other information bits. The idea therefore that knowledge is decomposable into facts or information-bits that are unproblematically recomposable in different combinations becomes questionable. Knowledge itself needs to

be constructed into whole sense-making combinations, and paradigms are the guiding framework of starting assumptions and taken-for-granteds for such work. The construction of a new paradigm is as much about constructing the framework as about constructing knowledge as such, and the interrelatedness and systemic character of the knowledge makes changes from old to new very challenging.[26]

Then paradigms don't simply exist as pure knowledge, they rely on an interconnected apparatus of texts, institutions, writing and publishing practices and so on. All of this needs to be installed, fine-tuned and maintained, with all the work and expense that entails. Hanseth explores the idea of knowledge as a network further by considering the internet. The first thing he notes is that in practice, knowledge in networks is dependent on high degrees of technical standardisation. Standardisation also means that network externalities apply: a particular standard connection protocol may confer increasing value on the network and information as more and more connections with the same technical standard are made. Historical or path-dependent processes then kick in, with an increasing systematisation of information and increasing lock-in of people already committed to the system. A technically or operationally better standard will have to overcome these network externalities, and objectively superior standards may be locked out.[27]

New standards do make the leap however and one of the ways they do this is by being compatible backwardly with old standards. New information is assembled or constructed in the new standard so that it is compatible (or at least translatable) in the old standard. This mode of piggy-backing on old technical standards while allowing access to the new is one of the ways that technical advance happens today and we see all sorts of technologies from information exchange protocols to computer operating systems, software and hardware, designed to new standards while being backwardly compatible with the old.[28]

Knowledges are embedded in historically elaborated and refined paradigms involving investment in work already done, procedures in place, and systems already made, and these simply cannot stop suddenly and shift to new paradigms. Networks of knowledge become, according to Hanseth, more like *infrastructures* of knowledge as all the structure and then all the associated apparatus, practices and organisation is factored in. Infrastructures in our common understanding tend to be large and heavy and hard to change. Knowledge has similar features: it is 'big, heavy and rigid - and not light and flexible'.[29]

Castells's new paradigm is explicitly technological - he conceives of it as constituted around a complex of microelectronics-based information and communication technologies and genetic engineering, and replacing the technological paradigm of the industrial age organised around the production and distribution of energy. His information is almost a taken-for-granted in all this: content or flow in the network, and dependant on this lightness of information for the 'synergies' he understands between different technologies.[30] Without this implausible lightness the synergies will depend on an ongoing work of translation and the maintenance of backward compatibilities. Knowledge paradigms are likely to be dense, specific, 'heavy' and durable. The fact that these networks are made and sited technical constructions would also suggest they can't be global in any way we can conceive outside of the networks themselves. It suggests that we technically construct more limited and specific 'global' paradigms in specific technical systems. I will illustrate this by looking at the work of Karin Knorr Cetina and her colleagues on working practices in financial markets and the way information and technology is incorporated into these practices, and then use their conceptual scheme to begin to interpret other real rather than virtual infrastructures.

Working with Information

Almost all today's business practices involve electronically mediated information, typically distributed and manipulated in expert systems, machine processed databases and even instantly updated information processed and streamed to screens in offices globally. At the same time a good deal of the communication between working professionals is transmitted electronically whether that be internationally or to the next office. The technology itself becomes part of the interaction, and humans and technologies participate together in working practices, which is to say that the division between the human and the technology is not simple or even necessarily locatable.[31]

What the financial trader (or trader and equipment) does is not so much read information and act on it, as produce in a 'production framework of interpretation', a 'shape' of the market. The attention of the trader is captured by an array of screens to which activities of perception and interpretation are directed. What is perceived however is not so much the data streaming out of them as the market and its components or objects rendered up in the technical apparatus.[32] Ways of doing things are linked directly with ways of seeing things - including the literal use of visualisation techniques and software, like the software *Technical Analysis*. According to Margery Mayall, 'TA in the contemporary trading and technological environment can be conceived of as an object in itself - one which may replace the market as the central object to which traders relate'.[33] It is clear that objects are only present, and actions and events can only take place *through* the technical system - they are produced in it and are quite literally incoherent outside of it.

Knorr Cetina has proposed the idea of 'epistemic cultures' which are neither disciplines nor communities, but sets of 'arrangements and mechanisms' including people, objects and technologies associated with the processes of producing and interpreting knowledge.[34] Epistemic cultures imply common modes of doing things in common situations and settings. The knowing of how to interpret things, and how and when to act, is supported *in* the situation delivered in the technics. A technically coordinated space and time is constructed in the apparatus, so that, as Knorr Cetina describes, traders in London and Zurich may be effectively in the same situation as they discuss a trade as it takes place in real time.[35] At the same time a common set of objects, a language to describe them, and common and coordinated ways of doing things, are built into and depend on these situations.

Knorr Cetina updates Goffman's face-to-face situations arguing that many of the interactions that matter today occur not in face-to-face situations[36] at all but in what she calls 'synthetic situations' technologically rendered and maintained. The interactions are not simply or directly human at all as humans act through technology and interact with technology: financial traders the world over sit focused on their screens and the coordinated stream of information, reacting in a technologically maintained space and time with its own objects and specialised interaction modes; and 'much depends on getting the synthetics right … This in itself implies a shift in power and relevance from the interaction to the situation'.[37] What is established is a background condition for action combined with a routine set of objects and structure of expectations. It is this routinisation and regularisation of work and conduct and the objects of work and conduct in prescribed situations that instils trust rather than the eye-contact of face-to-face.

We end up with a microstructured network architecture of global financial trading, 'more richly structured than the relational vocabulary allows for, [displaying] patterns of coordination and behaviour that are global in scope and microlevel in character'.[38] A global culture, more texture than structure, is localised in precisely engineered situations of

common objects and understandings where the relevant factor is not so much the flow of information, which would be illegible in its pure form, but the objects and shapes and ways of doing things that emerge or belong in the infrastructure.

Technical Networks

Financial trading takes place in an arrangement of technologically generated situations, connecting and coordinating objects, subjects and practices. These situations are synthesised in the technologies, and the functionality of the system is very precisely limited by the reach of the technical systems involved and by access to and interface with the system. We see an arrangement here which is less global structure than a distributed set of precisely specified, engineered and connected sites which together maintain an epistemic culture with all its material and practical accoutrements.

When we say that real-time technologies eliminate place, they may quite literally do this - but always in some technical network and in some place. Technical networks become the thin alignments delivering thick infrastructures to a select group who have access to them. The synthetic situation traders in London and Zurich share is literally placeless but when the server in Zurich goes down the technician has no difficulty finding it. The design of the technical system may construct a specific space and time but it does this not in some transcendent realm but in the actual sites networked by that technology, which also means that the situations are available only to those who have the credentials to get access to the terminals. This is a matter of a very spatial politics.

All this serves to highlight both the extraordinarily synthetic nature of this context for global action, as well as the power differentials such synthetic arrangements may generate. The technological paradigm itself is no universal. It is delivered in specific sites and the project from here on becomes to understand how society and economics have depended upon a sited materiality and technicity which has often gone unnoticed, or treated as if it were a constraint to more abstract processes rather than being itself the locus of social and economic process and the site of its very specific realisation.

The materiality and technicity of all this specifies very real anchor points for objects and infrastructures (even if these sometimes happen to be mobile devices) and definite and real interfaces between the different infrastructures financial traders act in, because they are not in the placeless space of global financial trading all the time, and the new paradigm has to be backwardly compatible with the old. The process of financial trading needs to be supported on the one hand by a precisely engineered infrastructure to make action possible or even coherent, and on the other it requires precisely engineered backward compatibilities with other infrastructures.

Today it may be possible to act towards some placeless place that presents itself as ‘global’, but this is an artefact designed into a technology which needs to be somewhere. Understanding knowledge in less disembodied ways, we might be able to ask whether other technological systems, like Roman roads, the Hanseatic League or the Thurn and Taxis postal system are not themselves also virtual and informational and something through which we act? The sorts of technologies that supported continental and even global networks historically were viable then as means to reliable action over sometimes vast distances. The old technologies, objects and practices had to factor in time delays but we do the same thing today when we set out on a journey to a place we know the technology we are using will get us to.

Could it be that the distinction between real and virtual is spurious when we are looking at the world through a network or relational lens? And is the world today as formless or simply bifurcated as the informational view would have us believe? It

appears that financial traders act in a 'thick' infrastructure which situates the objects, practices and knowledges they deal in. We have certainly synthesised thick infrastructures and situated objects and practices and codes of practical knowledge in them before. The medieval trading route was the high-tech global technology of its day, synthesising the situations from which people could act globally and connecting those towards which they could act. They contained all the apparatus and organisational factors to facilitate action, for those who had the correct access credentials. We could imagine the ports of mercantile trading as the equipped workstations of their day, with the bankers, agents, insiders' gossip, shipyards, warehouses, quays and jetties, and the skilled people to service all of these. The trading routes and ship departure schedules made doing something at a distance possible and reliable and not just a shot in the dark.

Places in this view are equipped terminals maintaining synthetic situations technologically. They maintain commensurability between their respective knowledges and equipments in order to maintain the functionality of the system. They come in networks and in packs, and we act from place to other places across networks which maintain compatibilities and equivalent possibilities for action. Action is therefore a joint achievement of the actor and the synthetic situation. The places towards which one could not act are simply not part of the particular technological paradigm, so that the system is both connected and bounded by the technics.

Modern Amsterdam

After 1850 a creeping technology-driven revolution took place in the Netherlands as land and water conditions were brought under increasingly centralised and bureaucratised control. Improvements in drainage and movement infrastructures saw large areas of an 'empty land'[39] become inhabited. The infrastructures laid down then were to determine the shape of the contemporary landscape.[40] But in and between cities over continental and global ranges, infrastructures had been implicated in this determination for much longer. Pre-20th century Amsterdam was dominated by its harbour and internally structured around goods movement through a ring of canals oriented on the harbour.[41] These canals centred an infrastructure with its associated knowledges, practices and objects, a material urban culture of merchant's houses, warehouses, quays, porters and barges, as well as other facilities and activities like markets and industry that depended on and oriented themselves towards the canals.

But the harbour was not just a part of Amsterdam, it was also part of an infrastructure of trade and colonial exploitation that connected to other ports in Europe and the East and West Indies. It was through the harbour that significant contact with the outside world was made. The harbour was also where most of the activity was - at the interface and articulation between the intra-city infrastructure of canals and water transport and an inter-city system of trade and exploitation. In the second half of the 19th century a belated industrialisation brought renewed economic vigour and Amsterdam began to expand. New industrial, harbour and housing areas began being built beyond the walls that had contained the city since the 17th century.

The city changed suddenly from being a declining trading port into a small but dense and growing industrial city. A city within walls and oriented on its harbour began reorienting as it expanded on the land side. A number of significant street grid adjustments were made as the street pattern was adapted to new patterns of use and movement.[42] The wall itself was demolished to build new housing and factories as well as take traffic around the edge of the centre. Around the turn of the century the municipality began taking more control of developments. This time also coincided with the municipal take-over of the tram, gas, water, electricity and telephone services and the beginnings of a different

kind of modern social contract between citizen and government.[43]

The public take-over of the already rather well-developed tram system in 1900 put in place an important component of the project of city building of the post-first world war years. This project saw the completion of much of the Berlage Plan Zuid in time for the Olympics in 1928, and created a modern, social-democratic city in the place of the faded trading port Amsterdam had been just 60 years earlier. Infrastructure projects were concrete means to the realisation of the modern city: the logic of infrastructure was not just of accessibility but involved a project of the re-formation of the city. Van der Woud stresses a normality and 'common interest' as part of a structure of governance. This normality is instilled in people in modern technological and organisational conditions which along with their technological underpinnings become part of a collective field of perception, feeling and action.[44]

When new city areas were designed, the circulation pattern and public access to the centre were designed along with them. The public transportation system became an essential strategy for realising the municipal vision of a modern city.[45] An urban territorial unit became established as the city was concretely realised and 'clearly identified in different spheres of social action and social consciousness'.[46] The result could be seen as a material institutionalisation of a commonly known functional and perceptual structure within which people would communicate, interact and coordinate their activities.

It is not simply the plan of the city that was realised around public transportation; all the components of the modern city were realised at the same time. This distributed complex of components were ordered in relation to one another in an ongoing work of organisation and maintenance, and maintained in their order for the sense they made by being in place. The agency of this maintenance was not so much an organic society as a civic tidiness. This meant municipal minders: politicians and planners, but also gangs of street sweepers and rubbish removers. It had as much to do however with the fact that shops and houses and the other physical components of the modern city need to appear where we expect them, that we walk and cycle and take the tram, for the most part, in appropriate places, and that street signs and tram-stops and traffic-lights are where they are supposed to be. We establish in the infrastructure, a material semiotics of things in place which we maintain and do things in, as if these ways of doing things were perfectly normal - which of course they are.

The construction of a place is in a very fundamental way about the realisation and *objectification* of the thing and its components. It is also about the synthesis of a network of situations which are commensurable and connect with each other. In the simple case I am highlighting it means that a transport means and its associated schedules, routes, stops, and relations with local facilities, enable one to act in the network. There is a technological rationality about this that is inescapable. But this rationality is not universal: it is of the particular technical network, its objects and practices, and it ends where they end.

The question of how power is distributed in a city built around a technical armature designed for public access is interesting and more complex than it would appear at first sight. Firstly the normality built into the infrastructure is not innocent and the public regulation of behaviour at Foucault's bio-power level would require an analysis in its own terms. But, as interesting in the context of city building and design is the way orientations appear in the fabric. These appear in gradients in intensities of activity and types of activity that reflect our commonsense understandings of centrality and are tied to the logic of the technological paradigm. But

they are also reflected in the distributions of ethnic minorities, property values, or a general sense of place-value. Some of this looks historical (the direction to the centre is the reverse of the direction of spread of the fabric), but a closer look at the activity patterns suggests also that value and centrality is formed in the overlap and articulation of one infrastructure with other infrastructures. The harbour of pre-20th century Amsterdam was an interface and articulation between a global infrastructure of ports and another one of canals transporting and distributing goods within the city. The same place in the mid-20th century is an interface and articulation between a late 20th-century regional infrastructure of exurban centres and suburbs built around road and rail systems, and an early 20th century urban infrastructure of residential neighbourhoods and public transportation.

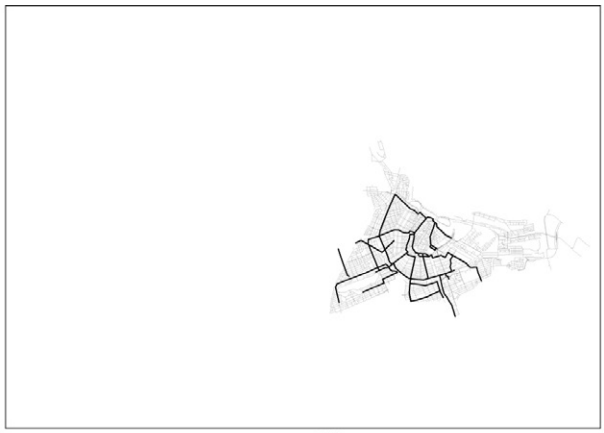
The regional infrastructure supports a network of business, industry, commerce, residential areas and the practices of goods transport, commuting, shopping and leisure that go with them. All this overlaps in the historic centre with a transforming modern urban infrastructure. Today the largest infrastructure project in Amsterdam, the Noord-Zuid metro line is intended to strategically accelerate the transformation of the modern city of Amsterdam to a post-modern, post-industrial, urban node integrated into a metropolitan region. It draws the interface between modern and post-modern infrastructures through the modern fabric, opening new areas in the city itself for metropolitan scaled functions. It also creates new gradients and power differentials in the fabric which may condemn marginal areas to an even deeper marginality. The public opposition to this plan by many of the city's residents reflects the way it is seen to undermine, and even dismantle, an earlier realised ideal. [fig.1]

The Form of the City Today

At the beginning of the 21st century it is no longer the tram system or a municipal city which is dominating discussion about the form of Amsterdam, but the motor car, European rail links, the airport, tourism, and regional polycentricity. Regimes of movement and place-identity today, for a large proportion of the urban population, are tied not to inner-city neighbourhoods and places but to networks of places beyond the bounds of the modern city. For some this means that the order cities once had is lost and that the city is exploding formlessly into the periphery. Here, in a sprawl of disparate and unrelated elements, we are condemned to live in a 'state of suspension'[47] between a disconnected local and the fluidity of networks.

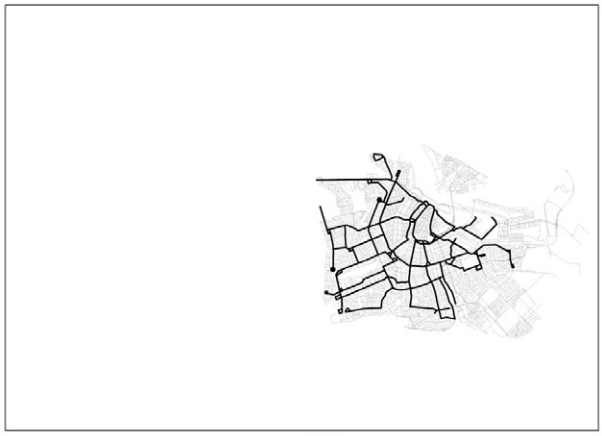
The view I am sketching here allows us to see the order in all this: regional and national rail and road systems are the thin technical networks towards which thick infrastructures of regional objects, subjects and practices are oriented. For Reyner Banham, writing more than 30 years ago of Los Angeles, '[t]he freeway system in its totality is now a single comprehensible place, a coherent state of mind, a complete way of life'.[48] Business, commerce and industry exist today in production, supply, and customer networks as part of this infrastructure, and urban people and functions have relocated here. While the process of the making of the metropolitan city has not been as politically explicit or publicly visible a matter as was the making of the modern city, we nevertheless see a specific technological rationality in it as transportation planning and highway engineering have worked to systematise it and give it form. Luki Budiarto is tracing the evolution of the highway network since 1955 and showing how it has been designed for performance around new standards of traffic speed and capacity. He has shown how a regional space and scale has been constructed in that time, establishing a space distinct from that of the modern city.[49]

But the objects and practices that gather to this new infrastructure don't exist on their own. Many of the metropolitan places metropolitan people



TRAMNET AMSTERDAM 1900

10 KM



TRAMNET AMSTERDAM 1930

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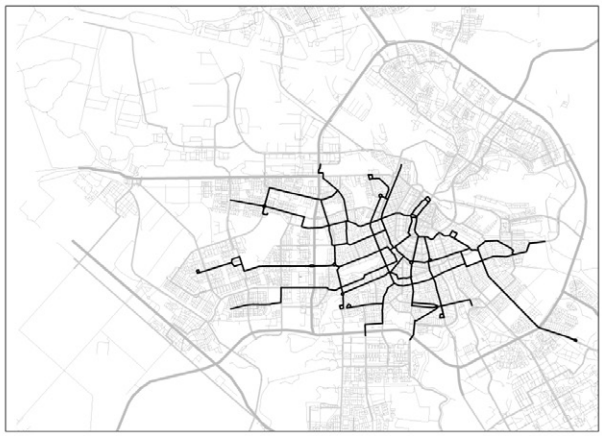

TRAMNET AMSTERDAM 1995

10 KM

Fig.1: The municipal tram system in evolution 1900, 1930, 1995. From 1900 to 1930 we see the growth of the modern city of Amsterdam around the tram network. Beyond that the further extensions of the municipal city have become increasingly remote from the centre, socially problematic and tied up in uncomfortable conjunctions with new objects and places oriented to the metropolitan infrastructures.

travel to are strongly articulated with other already established infrastructures, and the metropolitan infrastructure, as it has grown, has always been backwardly compatible with historical infrastructures. I have already mentioned the backward compatibility of new practices with older ones, but there are important spatial senses in which backward compatibility works as infrastructures articulate with other infrastructures. Infrastructures are articulated with one another so that, for example, the centre of a modern city may be at the same time a centre in a network of regional centres, and this overlap may be generative and place forming.

Backward compatibility means also that as the process extends, we will tend only to *see* places already made and already named. In the network topology I am describing, we no longer do things on a Cartesian surface but in networks of places from inside of which all we can see and all we have to work with are the places in the network. The imperative of backward compatibility works also at a level of connection with invisible networks like water, energy and waste removal, not to mention access roads and sites for building.

So the growth of a new infrastructure like that of the metropolitan city is always and necessarily constrained by backward compatibilities with what was built before. Medieval, mercantile, industrial and municipal networks all contribute to the way van der Woud's 'empty land' has been transformed in a process that combines new, usually bigger infrastructures with already real places that articulate and direct not only real developments but also our virtual knowledge of them. The place of Amsterdam's centre is not bounded therefore, but sits as a hinge at the articulation of infrastructures separated by an order of scale - as city infrastructures meet regional ones.

I don't propose a finished picture here of the metropolitan city, rather a sketch of a framework for understanding it as fundamentally relational and historical - and above all ordered. Using a framework that supports neither the centre-periphery form nor the bifurcation of urban space into physical and technological components, it becomes possible to propose a different way of looking at the development of the periphery. The idea of sprawl and of a disordered fragmented periphery follows from the idea that interurban development can be conceived as a disaggregation of the material of the city outwards from the centre and into a theoretically limitless extension. The 'dust cloud'[50] of peripheral growth into the 'horizontal city',[51] and the *terrains vagues*[52] that are their result, are ideas which represent this way of thinking in an at least residual form. Richard Ingersoll refers to Bergson however to warn us that disorder may be just an order we don't yet recognise.[53] In a view which sees metropolitan growth and form as part of the development of new infrastructures, stabilising new sets of objects, subjects and practices as wholes, sprawl becomes an ordered phenomenon oriented to a particular network.

This view becomes even more plausible today as we look at the extraordinary developments along the freeway network over the last years in the Netherlands. Driving on the intercity freeway today becomes ever less an intercity experience and ever more an urban one. This may be not a result of bad policies or planning, but rather an inexorable product of contemporary technologies and ways of living.[54] [fig. 2]

Conclusion

Peter Hall identified the Randstad in the 1960s as a multi-centred urban form emerging in the European context,[55] soon after Jean Gottmann identified a process of sprawling intercity growth emerging on the north-eastern seaboard of the United States.[56] Almost 50 years later we are still trying to understand this phenomenon, and to find adequate conceptualisations of its modes of growth

INTERCITIES NETWORKS 1930

INTERCITIES NETWORKS 1960

INTERCITIES NETWORKS 1995/2005

Fig. 2: The metropolitan highway system in evolution 1930, 1960, 1995. There is a steady systematisation which culminates today in a unity and wholeness that Reyner Banham found in metropolitan Los Angeles in 1971.

and transformation. I have argued that the real and virtual networks of today do not simply distribute already constituted knowledge, things, people and practices. These come to be and are organised and given form in relational complexes in which they all become context for one another. These relational complexes are not constraints to larger spatial or societal processes, instead they are the socio-technical systems in which social objects, subjects and practices are realised in the first place. I have called these complexes infrastructures, and described how they are discrete and bounded, heavy and durable, articulated with one another, and that changes have to transmit through the complex, redefining other things on the way.

The urban territory has been manufactured in infrastructures and networks of connected places and in historical time. Orders of scale have been established in the technical systems themselves. They are part of no ideal or universal scheme: the scales of urban networks are material-technological, specific and situated, and correspond with the objects and places - cities, neighbourhoods, houses, regions, even nations and globes - those networks realise.

Infrastructures are material and technical constructions which are costly and require purposeful design and installation, adjustment, upgrading and continual maintenance. Much of this work entails the mundane maintenance of keeping things in their normal or proper arrangements with other things so that they may be what they are and in place. Each of these arrangements embodies different material cultures, rationalities, and spacetimes specific to their networks. We may create placeless spaces and timeless times in particular infrastructures but have to be in place and on time in order to experience them. Mobile devices and wireless technologies change things, but we still have to be somewhere when we use them and forgetting this can lead us very quickly to methodological problems of spaces generating specious universalities and without concrete means of support.

Contemporary orders have developed by new infrastructures being superimposed over old, transforming what came before while being constrained by what was there. Our urban world consists of multiple real socio-technical infrastructures which link up equipped places in which we act and which make such actions both possible and reliable across distance. Many spaces for action are secured in other spaces and access to them restricted to the particular people accredited to carry out those actions. There are other technical networks that are more overtly urban though and which distribute urban elements like harbours, airports, railway stations, bus and tram stops, parking garages, regional shopping centres, business and industrial clusters and historical centres, facilitating a systematised access to places in networks and to the ways of life and of doing things they support.

There are a number of more general conclusions that lead from this proposal. The first and most subtle is that all spatial relations require the intervention of something else to frame the relation. The fact that a shop and another shop are related requires the intervention of a shopper or a street to make the relation. In this sense no relations are pure; all are relations with the participation of an actor or an active infrastructure to whom or to which that relation refers and means something. Things don't just have relations of their own accord and there is no natural spatial order of cities as central place theory and other branches of spatial economics[57] would have us believe. Rather, human beings intervene in the world, making networks to put things in order and hold whole stabilised arrangements of subjects, objects and practices in place.

Perhaps the strangest conclusion we have to draw though is that all these infrastructures, whether built around virtual financial trading systems, or real tram

systems, are as real *and* as virtual as each other. Bruno Latour suggests that something is real if it is connected and does something. The shape of the market on a trader's screens and the tram stop in Amsterdam have exactly the same reality factor. But a tram stop also depends on being where it is and connected to what it is connected to to be a tram stop. Somewhere else it will be an incongruous construction of glass and steel, or scrap metal, or a feature in children's games. And if we imagine a sea captain coming into a Hanse trading port in the thirteenth century, the fact that he makes a *port* of a rather low-tech collection of houses, trades, quays, merchants and porters, is at one level a result of a customary and ongoing use and maintenance of this port in relation to other ports. The port is not simply a labour of the sea captain's imagination but it retains a virtuality that may change the object.

The same port is also a place of unexpected dangers and no-go areas to a woman, a minefield of canine territoriality to a dog, and an adventure playground to a young boy. Infrastructures may stabilise objects, subjects and practices but all events that take place in them need to be activated by specific human perceptions and intentions.

I have argued that the technological paradigm of Castells is far more divided and differentiated than he would seem to allow, with multiple technological paradigms all generating limited spaces and specialised possibilities for action. We need to think through the question of the respective powers of the global and the local: are we subject to a macrophysical architecture of technological networks delivering power from above, or are we able to enrol technologies of all types to maintain, invent and reinvent microphysical architectures of enabling places offering multiple ways of being and living? I have outlined a material and relational view of the city that finds our ability to do things in our immersion in spaces we ourselves construct precisely so that we can act in that way. The foundation of urban form is, I have claimed, in these purposefully and strategically constructed spaces, each of which embodies particular knowledges, frames particular objects and subjects and facilitates particular ways of doing things. Much of the power and efficacy of these networks lies in the detail, and talk of a pervasive connectivity is going to gloss and elide detailed factors crucial to the exact outcome of our strategic space-making. We need to think the way technological paradigms are differentiated and articulated and use this knowledge to deliver a 'dappled world' of varying niches or inhabitable places from the very large to the very small. By ensuring we don't live in a world of smooth pervasive power we can make diverse and creative places for action and inhabitation possible.

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Biography

Stephen Read is associate professor in the chair of Spatial Planning and Strategy in the Faculty of Architecture, Delft University of Technology. He completed his PhD in Delft and a fellowship at University College London before starting Spacelab Research Laboratory of the Contemporary City in 2002. He is interested in relationality in urban space and place and in the form of the contemporary city. Besides being busy on a series of papers exploring Heidegger's space, he is busy with investigations of real urban places as sociotechnical constructions in networks of multiple scales, and is working on a book provisionally titled Urban Life.

Forming a Capital: Changing Perspectives on the Planning of Ankara (1924-2007) and Lessons for a New Master-Planning Approach to Developing Cities*

Olgu Çalişkan

Modelling City Structure for a Semi-Developed/ Transforming Country: Formation of Core and Periphery

In the age of the so-called '*città diffusa*', '*edgeless city*' or '*elusive metropolis*', there is an apparent doubt about the relevance of the antagonistic conceptualisation of core and periphery to contemporary urbanism.[1] Although such a perspective can be quite valid when applied to developed urban systems, it would be simplistic to utilise the same terminology for developing 'peripheral' or 'semi-peripheral' countries, which are still formulating their own modes of inner and outer urban (trans) formations within specific contexts. In this sense, the conceptual duality between an urban *core* and a *periphery* is aimed to enable us to interpret the formation of developing cities such as Ankara, the capital of Turkey, as a model of a rapidly transforming country.

In its attributive usage, *core is a central and often foundational part, a mass from which the superficial parts have been cut or chipped away*. In other words, it is *the central part, of a different character from that which surrounds it*. In another definition, core is *the innermost part, the 'heart' of anything*. Drawing from these definitions, a core is the very essence of the body, containing its fundamental features; if you take it apart, the 'thing' - whether it is an object or an organism - loses its essence. Conversely, *periphery is the external boundary or surface of a space or object; something forming such a boundary; a border or an edge* and it is *the region, space, or area surrounding something; a fringe, margin*.[2] In these spatial definitions, *edge* and *margin* can be counted as key concepts, giving the notion its essential character. From a non-spatial point of view, periphery is *the outlying areas of a region, most distant from or least influenced by some political, cultural, or economic centre*.[3] In this use, periphery is relegated to a secondary position, compared socially to a core. Yet, periphery can also be taken as a fundamental part, determining the border condition of the core of the entire unit.

When we characterise the periphery as a *margin*, which is defined as a *region or point of transition between states, epochs, etc.; a moment in time when some change or occurrence is imminent*;[4] periphery takes on a dynamic character, representing an 'in-between situation' in a transitionary position. In addition, the margin presents a situation of *extremity* for being the furthermost part of something. Sometimes this extremity results not only from spatial positioning, but also from the content and the program it serves. If we continue an etymologic search, the concept of *marginality* comes to the forefront when the periphery and the margin are regarded. If by 'marginal' one refers to *the edge of the field of consciousness* (physiological) and represents *an individual or social group: isolated from or not conforming to the dominant society or culture; perceived as being on the edge of a social unit* (sociological), an a priori assumption on periphery emerges accordingly: By definition, it should be of minor importance, having little effect; be inci-

dental and subsidiary. Therefore, it seems that the periphery is categorically excluded from serious consideration, in political terms.[5] If this is the case, is such a conclusion valid in an urban context?

If we take the conceptual definition of the core and apply it to the urban context, 'core' should be represented as the innermost part, the 'heart' of the urban entity. It should lend the urban environment its primary character. From this point of view, the validity of the conception of 'core' may be questioned in terms of the phenomenon of human settlements. Whether in practical, functional or symbolic terms, the gravitational centre of cities does not necessarily coincide with the spatial centre of the urban form as a physical entity. Cultural preferences, economic relations, and changing modes and techniques of production are the factors which can make the central position of the spatial centre uncertain. This can be observed in the history of modern urbanisation in general terms. In urban history, urban peripheries could gain some significance through development and transformation processes.

The first systemic appropriation of an urban periphery goes back to the Republican Roman Empire. In ancient Rome, in order to reduce smuggling, the city limits - the customary boundary - were drawn further from the continuous fabric of the city and the urban core was stretched as far out as it was in the 4th century BC. From ancient times in Europe, when custom houses and city gates had been located at urban edges, the periphery remained important, with its enduring function of control, until the emergence of nation-states, where the outer political boundary of cities lost its validity. After industrialisation in the 19th century, the periphery gradually lost its cultural and functional importance, while water reservoirs, salvage plants, junkyards or leper houses came to be located at the periphery, 'marginalising' the margin of the city. This process went on at the city edge until the 'open city' concept appeared again in the post-industrial era, when the urban periphery regained its prestige with the boundless development trend of the modern metropolis in the early 20th century.[6]

In early urban geographical models, the modern capitalist city was represented by a clear distinction between centre and periphery from a functionalist point of view. [fig. 1] In a sense, those models can serve as concrete clues about the relative positions of functional city sections among each other. With reference to the fringe formation, the common feature of those models is the basic difference of their peripheral sections to those of the pre-industrial city. While the 'elite' of society tended to locate themselves in the core of the city, which is relatively prestigious owing to intensive political and religious activities, when compared to the poorly developed periphery in the pre-industrial city, the modern urban periphery was a relatively desirable location for mobilised upper-class society.[7]

On the other hand, the relevant condition of the notion of the urban periphery for today's metropolises does not coincide with the early urban structure models of the monocentric capitalist city. In the period of the dynamic transformation of urban peripheries, the static notion of periphery was to lose its validity. For Nijenhuis, 'the plans taking their shape and meaning from the distinctive opposition between city and land and or periphery', have no meaning at all in the present phase of urbanism. Since everything is mobilised, including bodies, goods, information, and perception in flow, fragmentation in space is a given reality in the regime of speed.[8]

In developing countries, it is difficult to observe an extensive space production in urban peripheries which is completely apart from the existing body of the core central city. The urban core in developing/underdeveloped countries still has a serious dominance because of the overwhelming dependence on central space. To Richardson et al. at the metropolitan level the average ratio of central city

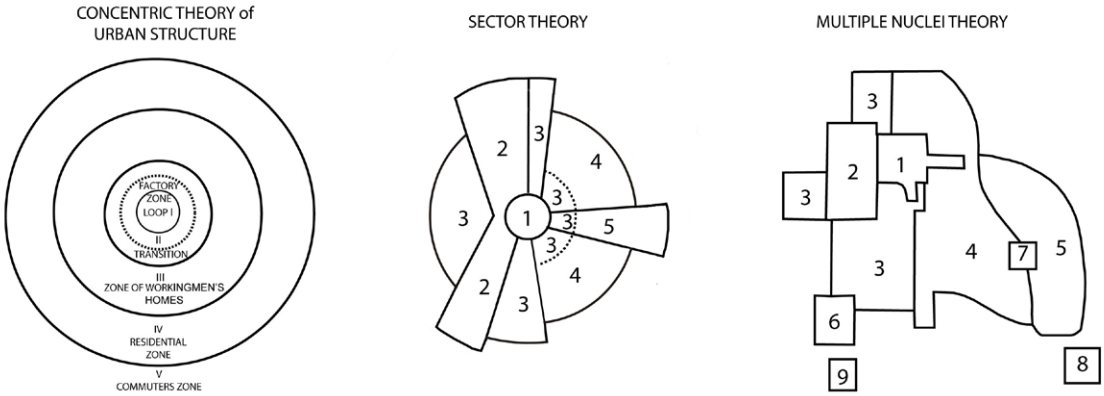


Fig. 1: The conceptual schemas of the theories of urban structure: 1. Central Business District, 2. Wholesale light manufacturing, 3. Low-class residential, 4. Medium-class residential, 5. High-class residential, 6. Heavy manufacturing, 7. Outlying business district, 8. Residential suburb, 9. Industrial suburb (source: Johnson, 1967, pp. 164, 166).

to peripheral densities is relatively higher than that in developed countries. It is because of this fact that decentralisation rates are much slower than the rate of the intensification of existing built-up areas in cities in developing countries. Additionally, the mean ratio of the central core area to the total metropolitan area in developing countries is higher than that of cities in developed countries.[9]

Intensification and external growth are generally considered as the contrary processes; however it is not the case in most cities in developing countries. While the reproduction of urban core by means of the intensification of central urban body is carried out, urban expansion goes on simultaneously in most rapidly developing cities. Densification and growth in the form of expansion as parallel urban processes are experienced within a dominant central urban body. That is why, unlike Western cities, the density surface gradient does not tend to decrease but keeps constant (increasing in some cases) in relation to the edge of the typical developing cities.[10] This fact, which prevents the city form from evolving into an open peripheral system, is mostly derived from an insufficient level of public services (technical infrastructure) provided, the scarcity of urban land (lack of public land reserved for planned urban extensions), the dominance of fragmentary and jointly owned non-developable land around cities and the mass of people lacking the capacity for mobility because of poor economic conditions (thus tending to locate close to urban services in the existing urban fabric). With varied combinations of these real factors, a serious development pressure emerges in inner city land.[11]

Another dynamic of such formation is the underdevelopment of the housing production process, which basically depends on small entrepreneurs rather than on highly organised, large-scale housing cooperatives. The limited capacity of building contractors results in partially realised, small-scale (plot-based) space production and the accumulation of the existing urban fabric - the core - by further additions, which can be called *core formation of the periphery*. All of these factors produce a real basis for a hardly controllable (or conceivable) 'oil-blot' type of urban form: an extension of the core with a homogenous and intensified/expanded urban body.

In terms of its historical context, showing signs of underdevelopment, and its current condition of rapid transformation towards development, Turkey provides a relevant case for a conceptual model of developing urban form with reference to the real factors named above. Public and private housing markets, which have rapidly developed in the last thirty years, provide an opportunity to observe a possible transformation of urban form in developing countries, from a core-dependent redevelopment scheme to a system of open development. [fig. 2] In this sense, the diagram of the proposed representative model depicts the common character of many Turkish cities, in which development is dependent on a dominant transport corridor - mostly inter-city highways which provide direct access to surrounding development areas. Yet the highway is not conceived of as a tool to control urban form; rather it functions as the carrier of the new urban extensions, which are mostly squatter and small industrial areas.[12] Therefore, large-scale highway structures and natural thresholds adjacent to the city are the major determining factors forming/directing the shapeless city footprint. While the existing centre is developed on the location of the historical city centre with modern extensions, a transition zone (belt around the core) as a diffusion area of growing commercial activity is always subject to plot-based, high density, high-rise re-development. Triggered by the increasing urban rent expectancies of landowners, the transition zone tends to expand within the entire body by transforming former single-family houses with gardens into apartments. Then small-scale retail activities find space within denser urban tissue in the first floors of the apartment blocks. This is basically the developing version of urban mixed-

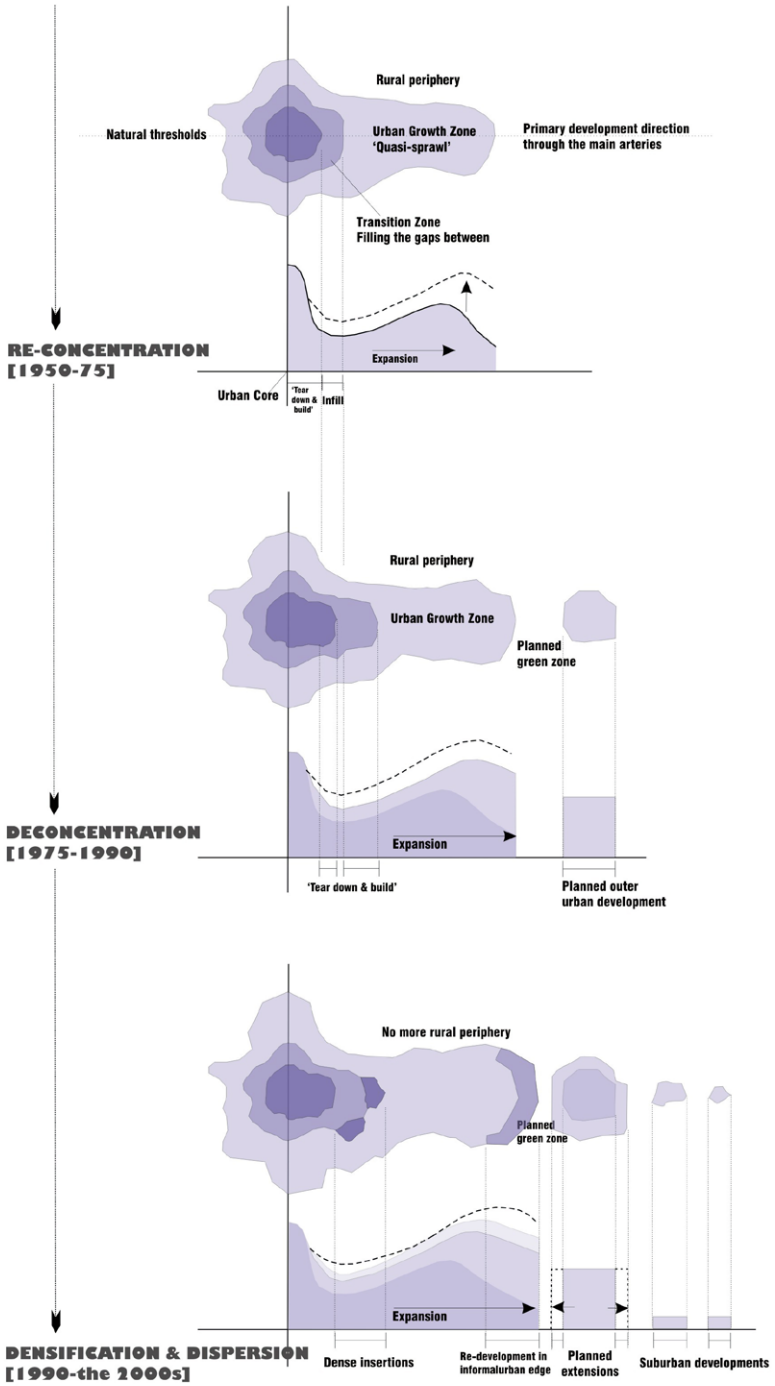


Fig. 2: Evolution of urban structure: 'Core formation' - the first phase - (source: Bilsel, 1977, p. 57) and its transformation within two periods in the case of Turkish metropolitan cities.

use which is not developed by a planning process, but evolves according to a small-scale free-market mechanism. On the other hand, the distinction between the core and the periphery is quite clear. Because of the limited capacity of planned urban land production by public authorities, the agricultural/rural character of the periphery is not rapidly transformed by urban extensions. The transition from the rural to the urban area is defined by the hybrid character of informal housing and by small industrial clusters through the main corridors, which provides a definition of an 'urban gate'.[13] This framework represents the first phase of the Turkish city, which kept its intrinsic character until the emergence of the first structural public investigations within the city fabric.

The second phase of urban formation emerges when social-democratic types of local government models became influential in many Turkish cities, from the mid-1970s. This phase coincided with the introduction of mass housing in the late 1970s. After the creation of distinct settlement areas with the help of a new mass-transit infrastructure (which had been implemented in most European cities from the late nineteenth century) and collective housing projects, a new phase of urbanisation emerged. Once the contractor-based housing production method turned into one based on housing cooperatives, the average size of developed urban land increased. These were the years when city planning became a profession distinct from architecture itself and a new understanding of urbanism at the metropolitan level was institutionalised in primary cities. Through the end of this period we observe the development of the private sector as large capital construction firms in housing. Yet this development would not create a shift towards a multi-central metropolitan formation supported by alternative large-scale developments in the periphery. The new districts in the urban periphery were formed as a large assemblage of mono-functional housing zones, without a large-scale urban composition approach.[14] In this sense, the new phase could not be realised in the form of 'new towns' as it did in Turkey's European counterparts after WWII. The radical shift to the periphery in this period did not influence the informal periphery, which would be transformed by the limited financial capacity of local governments. In this regard, a semi-developed type of urbanism determines the overall character of the second phase of formation: having the intellectual capacity to make a plan (with some deficiencies in design), but lacking the financial power to control the overall form with a public hand.

In the last phase of development, city formation took on a hybrid character in terms of the developmental dichotomy between the core and periphery. A clear tendency in space production towards the core or the periphery has been replaced by a multi-faceted development strategy, one which occurred in both core and periphery. While the periphery maintained its dynamism through the development of a private real-estate market after the introduction of neo-liberal policies beginning in the 1980s, the core city became subject to a severe transformation by redevelopment processes. From the mid-1980s, after the introduction of the 'Law of Development Amnesty', the squatter areas located in transition zones entered into a new phase of transformation. Such rapid transformation in the main urban body was directed by the partial amendment plans of municipalities and realised by contractors in the form of a 'conventional modern Turkish urban fabric': an aggregation of larger apartment units located in a single plot. This development was realised at the expense of higher densities and without adequate social services. Although amendment plans produced large sections of new, densified tissues within the urban body, they were not dealt with as *urban transformation*. Once the central state introduced a national law called 'Preservation of Old Urban Tissues by Renovation and Utilising by Vitalisation' in 2005, urban transformation was put on the agenda of Turkish cities. From that time on, the

cities have been experiencing a rapid transformation based on the redevelopment of informal housing areas both in the inner city and on the outskirts, through plans by the Housing Development Administration of Turkey (TOKI). Actually, this phase implies a 'developing' version of neo-liberalism which can only be experienced in countries which are shifting their direction from statism to neo-liberalism within a relatively short period of time. The projects which are programmed by the central administration are realised by private contracting firms with an absence of any public participation process at the local level. All of the transformation process is directed by the central plans produced by Turkey's Housing Development Administration, which are based on models of multi-storey house types, to be implemented in all Turkish cities despite their very different climatic and social conditions. This is basically the current dynamic of urban form which means a radical homogenisation of Turkish cities as a central strategy, one which is compatible with the free-market mechanism in Turkey. While this is the situation for the old core cities, the fragmented outgrowth of housing sites, mostly for high-middle and high-income groups, has put urban peripheries in an ephemeral condition within a diffuse and uncontrolled speculative development process. In this context, while the outgrowth of the existing planned urban extensions goes on, the fragmentary development of housing sites by partial planning diffuses into the outer periphery. The periphery no longer has a rural character with a growing expectancy on the part of landowners to get development rights. Thus, it is no longer marginal since the core has lost its place as a foundation.

At the end of the overall process we can define two types of peripheral segments for Ankara: informal and formal. While the informal periphery is constituted by the squatter settlements, it has evolved as a continuous penetration of the main urban body towards the natural thresholds of the undeveloped fringe. The spine of the extension is mainly determined by the main highway corridors of the city. On the other hand; the formal periphery by planned urban extensions has a hybrid, disintegrating character. The morphological hybridness of the formal periphery results from the combination of large segments of planned new settlements and the small fragmentations around them. [fig. 3]

While this transformation is occurring in the inner and outer peripheries, the transition zones of the central cities have become subject to another partial transformation process in the form of dense insertions within outer core areas. Through this process, new office spaces and shopping centres have been created in the form of large-scale (mostly high-rise) architecture alongside the main inner urban arteries. Radical transportation operations, such as capacity increases through multi-level crossroads in the main city fabric, accompany this restructuring process. This is basically a direct response to the emerging demand of a growing real-estate market which cannot take hold within a dispersed urban periphery.[15]

Considering the same development dynamics (the same legal framework, type of actors in the production process and common political approach at the local level), we can generalise from this three-phased structural transformation model for other Turkish cities; however, it is reproduced in different forms. Because of the co-existence of two modes of urbanisation, one formal (planned) and one informal (uncontrolled/squatter type), it is quite difficult to conceptualise the structure of Turkish cities in terms of the conventional models of urban geography (depicted above) which are mainly based on developed Western cities. In this sense, it is much more relevant to model the transformation of Ankara's urban form as an exemplary case of transforming urbanism in a semi-developed context by considering the social and economic driving forces behind the formation of its metropolis.[16] For this reason, reading urban (trans)formation by the series of

master plans can be proposed as an alternative approach for a clear understanding of the form and the process, because master plans are supposed to reflect the objective conditions of their time in terms of urban space/land production. In the case of developing countries, they enunciate the enduring spatio-political approach of the state, which is still active in space production because of the limited capacity of market forces.

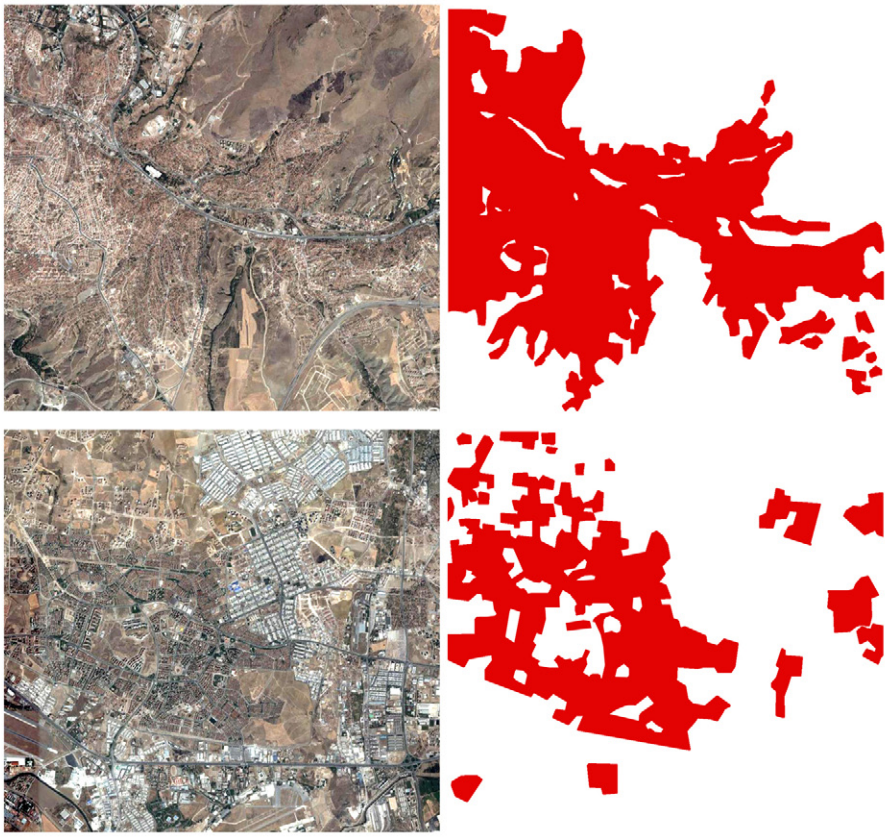
After this lengthy introduction defining the developmental and transformational character of the Turkish metropolis, with reference to the phenomenon of 'developing' urbanisation, we can go on with an examination of the role of master plans in the formation of the city of Ankara. With each plan term, the aim is to reveal the changing perceptions in space production at a macro-level of scale, within the enduring antagonism between core and periphery. In the conclusion, a series of lessons from the master-planning experience in Ankara is discussed, aiming to provide some generalisable lessons for other cities in a similarly 'developing' context.

Master Planning of Ankara: *Shaping the City from the Periphery*

From the above, it is quite possible to typify the different modes of urban formation and follow the phases depicted by the model by means of the five master plans for the city of Ankara. Instead of an exact picture of its projected period of time, each plan represents a specific state of mind, producing its own concept of space within the distinct socio-economic and political conditions mentioned above. Framed by the different externalities of their time, each master plan takes a major ideological position between *centrism* and *decentrism*.[17] They can be revealed either explicitly or implicitly depending on the clarity of the scheme or the plan discourse. According to Günay, the master-plan schemes for Ankara can be classified into two types, according to their eventual influence on urban form: the first three producing the core area of the city, and the following plans producing the peripheral sections of the urban fabric.[18] Although it represents a relevant categorisation of the current condition of the city, we must consider each master-planning scheme in its own context, producing a new peripheral formation which would in time function as part of the main urban body. It could then be recognised that all the master plans for the newly developed capital have been in the necessary condition of needing to formulate their own mode of urban periphery. This mainly characterises each planning approach ideologically in urbanism in the context of the antagonism between centrism and decentrism.

Jansen Plan (1932): *Aggregation of the parts*

After the War of Independence, in the early 1920s, not only social and economic development but also spatial regeneration became an urgent question to be solved in the Turkish Republic. The prior agenda of physical planning in those years was to rehabilitate the urban fabric devastated during the war and the production of planned settlements for immigrants from the Balkans. The new capital of the nation-state and its planning were of major importance to the regime, as Ankara was supposed to be the model for other Turkish cities.[19] The early evolution of the small but strategically located town of Ankara into an urbanised capital was directed by the master plan prepared by C. Ch. Lörcher, a German architect, between the years of 1923 and 1928. This plan gave direction to the early constitution of the new city fabric and the construction of the main buildings, located in both the historical centre and in the emerging city extension. While the plan transformed the peripheral agricultural land into plan parcels, it basically designated the border and the main growth direction of the city. The chief development strategy of the plan was locating new plan developments adjacent to the existing historical core of the city. Then the prominent paradoxical antagonism between the historical core and the planned periphery would be solved by the integration of the historical city into the emerging city structure, with



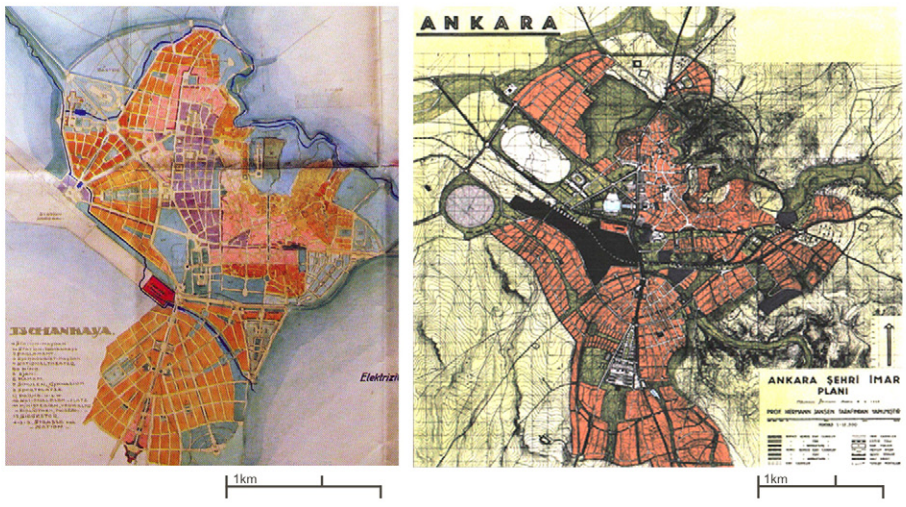


Fig. 3: Peripheral profile of the city of Ankara: common morphological distinction in Turkish cities - contiguous extension of informal settlements -above- and leap-frog fragmentation of outer planned developments -below-.

Fig. 4: Plan schema of the Lörcher Plan (1924) and the development plan of the city of Ankara by Prof. H. Jansen-1932 (Source: Cengizkan, 2004, p. 245; Harita ve Plan Belgeleme Birimi [Maps and Plans Documentation Unit, Faculty of Architecture], 2007).

modern boulevards and green corridors on which plazas and squares were located, arranged in a series. Nevertheless, the plan itself could never be implemented. One of the main reasons for its failure was the plan's vision of the periphery. The dominant design perspective in residential areas in the periphery was influenced by the Garden City movement, which was quite popular in Europe in those years. Actually, this low-density level would be one of the criticisms of the plan, which reflected economic and cultural concerns because of an inefficient use of space and the 'alienated' social environment created in the periphery as an indistinct urban tissue with detached villas for the new republican bourgeoisie.[20]

The effect of Euro-urbanism continued after the first master-planning experiment for the new capital. In 1928, the Ankara Urban Development Council arranged a design competition, inviting three European urbanists: L. Jausseley (France), J. Brix (Germany) and H. Jansen (Germany).[21] As a result of the competition, Jansen was given the authority to direct the planning process for the new capital. In terms of the idea of forming the city on the existing nuclei of the historical core city, Jansen encountered the same paradox between the 'new' and the 'old' which had applied to the Lörcher Plan.[22] Jansen's attitude towards the historical core was quite conservative. In his view, 'a glass globe should be put on the historical core of the city' and the new development should be realised without touching the old one. By directing new development pressures to the outskirts of the city, the historical fabric would be preserved and new urban space would be free from any of the binding conditions under which old structures had evolved over time.[23] Accordingly, the new urban form appeared as the sum of the separate entities of the old city and the new extensions within the whole.

Jansen specifically warned against the speculative demands for non-programmed developments. He believed that the plan boundary and the control of urban development within the urban fabric were essential to success. Otherwise, *scattered* development in the outer fringe would have disturbed the essence of the plan.[24] Yet, like the Lörcher Plan, Jansen's schema did not properly define urban fringe by design codes. Design geometry and the pattern types resembled the Garden City models, with an urban image based on a low-density, low-rise settlement pattern within separately defined neighbourhood units, like those in the Lörcher Plan. With both the housing types and the circulation system designed to be short and narrow, to maximise economic benefit, the style reflected a culturalist approach, rather than a progressivist one. The size, scale and the types of the buildings in the plan proposal did not reflect a progressivist/modernist conception of space, one which would produce space-dominant, over-scale public spaces or housing estates. Nevertheless, such a style did not produce a continuous and intensified type of urban fabric as it had in Europe. This would lead to a major transformation problem, one of turning the new urban tissue into a central city in time to keep up with the coming rapid growth of the city. On the other hand, the Jansen Plan provided a basic structure for the inner city, one that helped determine the future evolution of its urban form. In this sense, it produced a basis for the first phase of the formation model noted above.

The urban form proposed by the Jansen Plan is a relatively central and inward-looking in its two-dimensional form. The main concern of the Jansen Plan was to create a city that was different than a semi-rural Anatolian town. For this reason, a centralist approach at the macro-level was inevitable. On the other hand, the envisaged urban image was a product of a decentrist approach, envisioning low-density peripheral urban patterns. Therefore, overall the Jansen Plan can be considered as a compromise position.

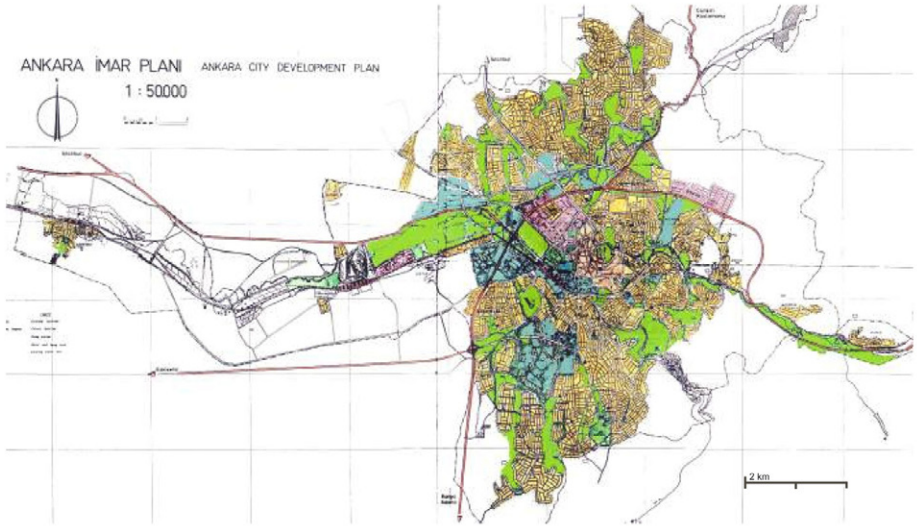


Fig. 5: Plan schema of Yücel-Uybadin-1957 (Source: B. Günay, personal archive).

Fig. 6: Transformation of an ex-peripheral planned development in Ankara during the 1960s: original plan of Jansen (1933) -top left-; figure-ground of the plan layout - top right hand the existing situation of the area after the transformation -below-.

Yücel-Uybadin Plan (1957): *Unification by banding*

The 1950s represent the period when the Turkish political system was re-established, based on the multi-party democratic system in parallel with political unification with the West after the Second World War. The unification was led by the U.S. Marshall Program, which had an influence on the Turkish economy as well. In this period, the modernisation of agricultural production resulted in huge numbers of people leaving the labour force in the rural regions and migrating to the large cities to find a job. Like other major Turkish cities, Ankara, the capital, was directly affected by the massive migration from the east, the least-developed part of the country. In 1956, the population of Ankara had doubled over the previous ten years and reached 455,000. In 1955, an international competition for a development plan was announced, with Luigi Piccinato and Sir L.P. Abercrombie serving as jury members. The competition resulted in the choice of Turkish architects Nihat Yücel and Rasit Uybadin's plan proposal.

As Ankara's second development plan, it did not contain a vision for the transformation of the urban core because of rapid growth. On the other hand, the basic mission determined by the plan was gathering the partial developments into a systemised holistic structure.[25] The plan proposed a homogenous city, one that was closely packed and pressed within the municipal boundaries. The plan was also in continuity with the green-belt ideology of the garden-city tradition.[26]

Differently from the previous plan, local socio-political actors were mainly responsible for determining the formation of the capital in the 1950s. They were made up of both decision makers and pressure groups that had great expectations for renting out the inner urban land. Furthermore, the municipality was not capable of developing separate new settlements out of the inner city, because of the lack of publicly owned vacant land stock. These factors made a leap-frog development towards the urban periphery as an alternative growth pattern impossible.[27]

In 1959, just two years after approval of the plan by the ministry, a revised plan proposal called the 'Bölge Kat Nizamı-District Height Regulation' was presented by the governor and the mayor of Ankara to the public. It was a positive response to density requisitions, augmenting development rights for numbers of floors. The plan proposal was approved in 1961 despite counter-arguments by N. Yücel, who warned of a kind of sub-standard 'apartment-city'.[28] As a result, building heights began to double and even triple and a high-density apartment-type housing emerged. While the net density level in those districts had been proposed as 200-350 p/ha by the Yucel-Uybadin Plan, it increased as much as three times, to the level of 600-650 p/ha.[29] Excessive housing supply processes that continued to the mid-1970s caused the settlements around the CBD to be highly concentrated.[30] The new phase of development mainly transformed the ex-peripheral zones of the city, which had been produced by the first master plans, into parts of an overloaded urban core with low levels of spatial quality.

While buildings were demolished before their life spans had ended and were replaced by high-rise apartments, the urban image was completely contrary to the old fabric produced by the Jansen Plan. The main reason for this poor quality urban typology was its process of spatial transformation. The urban texture suggested by Yücel-Uybadin inherited the layout of the Jansen Plan. It was basically shaped by rectangular building blocks, appropriate for low-rise detached housing plots. When the old urban building type - detached housing based on two- to three-storey single family villas, constructed mainly for the early republican bourgeoisie of the capital - was replaced by the new one - apartment blocks - on the same plot layout, conventional solid-

Fig. 7: Squatter districts throughout the main outward arteries in the year of 1966 (Adapted from İmar ve İskan Bakanlığı, 1966) and the typical 'organic' pattern of the squatter districts evolved from the early 1950s (Source: personal archive, 2007).

Fig. 8: Structural schema of urban form by Ankara 1990 Plan (Source: Harita ve Plan Belgeleme Birimi [Maps and Plans Documentation Unit, Faculty of Architecture], 2007).

void space relationships were radically shifted and extreme density measures were created in the city fabric. [fig. 6] All of these factors together produced an 'oil- blot' type of urban form with densifications inside and expansion to the outside in the period covered by the plan. It corresponds to the first phase of the formal transformation of the city, which is typified by expansion with an overall density increase. [fig. 2]

Like the Jansen Plan, the Yücel-Uybadin Plan dealt seriously with boundaries. During the implementation of the plan, its authors clearly emphasised the necessity of restricting new developments to plan boundaries.[31] Yet, the bounded development within the existing urban body allowed land prices to increase and encouraged unauthorised construction in the vicinity of the planned development areas.[32] This became the driving factor for further urban expansion. Then, squatter areas developed around the main arteries of the city; by the mid-1960s these areas were relatively affordable and accessible from the working districts of low-income families and from the areas around the core city. [33] [fig. 7] Since the northern and eastern entrances to the city were blocked by unauthorised building sites, these fringe areas could be conceived of as the 'margin', both physically and socially, by the end of the 1970s.

The Yücel-Uybadin Plan, with its subsequent revisions, can be positioned ideologically as a centrist approach. Yet it is original in the Turkish case in that its centrism did not coincide with an urbanist point of view. It actually produced a kind of 'anti-urban' mode of urban form at various levels of scale: high-density without diversity at the intermediate scale and clear social segregation within a highly concentrated urban body at the macro-level. The lack of robustness of the fabric inherited from the foundational planning period of the cities resulted in a radical transformation under huge social pressure of growth which could not be directed by state policies. This was the paradox of 'growth amidst underdevelopment' which is experienced in many rapidly transforming countries.

Ankara 1990 Plan (1975): *Stretching the saturated body*

Because of the high land prices within the planned inner city, almost sixty percent of the population - the low- to middle-income families who could not afford development costs - were excluded and compelled to locate in adjacent, unplanned areas of Ankara's inner city in the late 1960s.[33] This development pattern can be taken as a model-example of 'undeveloped/unplanned urban compaction'. On the other hand, the dominant trend toward vertical densification in the urban core was reduced due to the emerging process of the recessive extension of the city. When air pollution in the inner city became a real problem due to the inner-densification process, the need for a new master plan emerged. Consequently, the Ankara Metropolitan Area Master Plan Bureau (AMANPB) was founded in 1970, as a department of the Ministry of Development and Housing. The bureau's importance to the urbanisation of Ankara was derived from its planning approach to the future direction of city development. The bureau aimed to canalise future development in a corridor schema based on the topographical crack around the city.[35] Major objectives of the plan were:

- to achieve an economical physical structure, minimising investment and management costs;
- to minimise environmental pollution;
- to enrich the relationship of the built-up and the natural environment;
- to ease accessibility to rural areas; and
- to increase the percentage of green and open areas.[36]

For the first time, a master plan for Ankara aimed to integrate land use and transportation, which is still essential to any sustainable urban development strategy. The main plan criteria were defined based on the state of integration vs. decomposi-

tion (problematic in decentralisation), density and geometrical plan form.[37] Integration and decomposition here basically represent two extreme conditions of maximum compaction and dissolution and define the border of the form of future development to be proposed by the plan.[38]

Within this framework, the bureau chose the corridor development as the final plan schema from a set of alternatives. It was envisaged as the best alternative, a controlled open system that would help solve the ongoing air-pollution problem. In this way, the inflexibility of urban form, as proposed by the previous plan schema, was to be surmounted by the new development schema of the Ankara 1990 Plan. By means of 12 different development zones on the corridors, the plan aimed to locate 48 percent of the projected population in decentralised development districts.[39] The linear development was aimed to be structurally defined by a transit line which would have transfer points around which the housing districts would be concentrated.[40]

It is important to note that all the housing estates produced under the initiative of the Ankara 1990 Plan do not represent a modernist conception of centrism, despite having a high-rise and high-density formation. Some mass-housing examples produced by cooperatives are the result of a preference for high-rise, high-density development rather than for creating more open spaces, as in modernism.[41] As a result, a strictly conforming high-density urban pattern in the inner city was reproduced on the urban fringe in the form of additional extensions. This created a duality in the fringe areas of Ankara: a low-rise, medium- to high-density urban pattern of squatter areas and a high-density, high-rise urban pattern of mass housing. This reality represents the remarkable point that in developing countries, a shift in the mode of housing production, from individual to collective housing, would not necessarily be realised in the same form as developed earlier in Western capitalist countries.

In this plan, the urban periphery was positioned at the 'core' of the design concept. In terms of the idea of the urban periphery, the Ankara 1990 Plan brought the issue of the relationship of humans and nature to the Ankara planning agenda for the first time. Basically, it signified a serious development in Turkey's young city-planning tradition. The plan answered this ontological question with a legible city form, open to the periphery in a controlled way. Control is ensured by planned penetration towards urban fringe areas. From that time on, the periphery would be the territory to be controlled by future plans for further developments. On the other hand, since the perception of periphery was not based on a suburban type of development but on a controlled-density surface, the Ankara 1990 Plan can be regarded as the most 'urbanist' planning perspective that had ever been put forward with reference to the issue of the periphery. In this way, Ankara experienced the second phase of the evolutionary model based on deconcentration, which typical European cities began to realise in the first quarter of the twentieth century.

Ankara 2015 Structure Plan (1986): *Leaping beyond limits*

Since the military intervention in September 1980, the political milieu in Turkey has radically transformed into neo-liberalism in harmony with the dominant trend in Europe and the United States. In this period, metropolitan planning bureaus, one of which had produced the last master plan for the capital, were closed by the central government. Because of a series of partial development-reclamation plans at the beginning of the 1980s, the proposed balance between population and density throughout the urban fabric was significantly damaged. Such a trend was supported by, the Law of Exemption of Development which was enacted for the squatters' areas in 1984. By this law, the informal settlement areas in the cities were subject to be legitimised by a series of uncoordinated transformation plans.

Within this climate in 1985, a planning group from the Middle East Technical University was commissioned by Ankara Metropolitan Municipality to make a comprehensive urban macro-form analysis and metropolitan plan to coordinate the new transit system project to be introduced in the beginning of the 1990s.[42] The plan prepared by the group should be considered as a policy plan or structure plan but not a master plan. Its structure covers a wider metropolitan area than that of the Ankara 1990 Plan.

Within this extended plan boundary, the key strategy of the plan was decentralisation. According to this strategy, alongside the existing urban fabric of Ankara, all the settlements listed above were envisioned as growth nodes in the overall urban system. Decentralisation was not a normative position held by the study group but a real trend experienced at the time. Rather than widespread decentralisation based on private car ownership, decentralisation in the form of a star-shaped city structure based on public transportation was suggested. The generation of a green-wedge system by increasing the width of the existing one to 8-10 km in order to create a microclimatic effect of air circulation was another key point of the plan.[43]

The group perspective on the reproduction of the urban core by further intensification was clearly negative, unlike that of the Ankara Metropolitan Area Master Plan Bureau. The study group regarded Ankara's compact urban form, defined as a 'high-density oil-drop form', as the source of enduring problems such as air pollution, unfeasible transport and infrastructure provision and sub-standard urban spaces. Thus, it was claimed that after thirty years, with a projected population of five million, keeping the city in a compact macro-form would have resulted in 'the death of the city'.[44]

Even though the plan had a clear tendency to control urban form, for the sake of flexibility, the decentralised schema without a continuous border definition of built-up areas destroyed the possibility of a legible urban structure. With a highly elusive city form, a green belt would not be an effective tool for controlling development through the corridors. The Ankara 2015 Plan provided a system which is open to further conurbations within a decomposed urban structure at the metropolitan level.

The planning approach taken by Ankara 2015 can be seen as a breaking point in the planning history of Ankara. For the first time a decentralist approach was manifested in a master-plan document. Such a stance was constructed on a radical conceptualisation of the urban periphery, which is still subject to discussion regarding the limits of the economic affordability. The new conception of the urban periphery was based on an over-scaled definition, one which included the surrounding settlement nodes within the metropolitan hinterland. By suggesting a decentralised and linearly scattered urban structure in the shape of star within a wider context, the plan represents a counter-argument against former centralist schemas composed in different forms. On the other hand, by envisaging a polycentric urban system with the mix of high- and low-rise settlement forms, the plan did not refer to a common typology of decentrist urbanism based on a low-density, low-rise urban pattern. Therefore, Ankara 2015 cannot be classified ideologically as a conventional decentrist/disurbanist point of view. Since society was not ready for radical decentralisation based on a low-rise suburban dispersion, the plan proposal still had to conform to existing transport arteries and the macro-structure provided by them. Even though the plan paradigm shifted, the real conditions were not ready for such a change in planning perspective at the time of a socio-economic transformation.

Ankara 2025 Plan Schema (1997): *Dissolving the urban body*

Different than in the previous plan period, from the beginning of the 1990s the real basis for a radical version of deconcentration emerged. Increasing

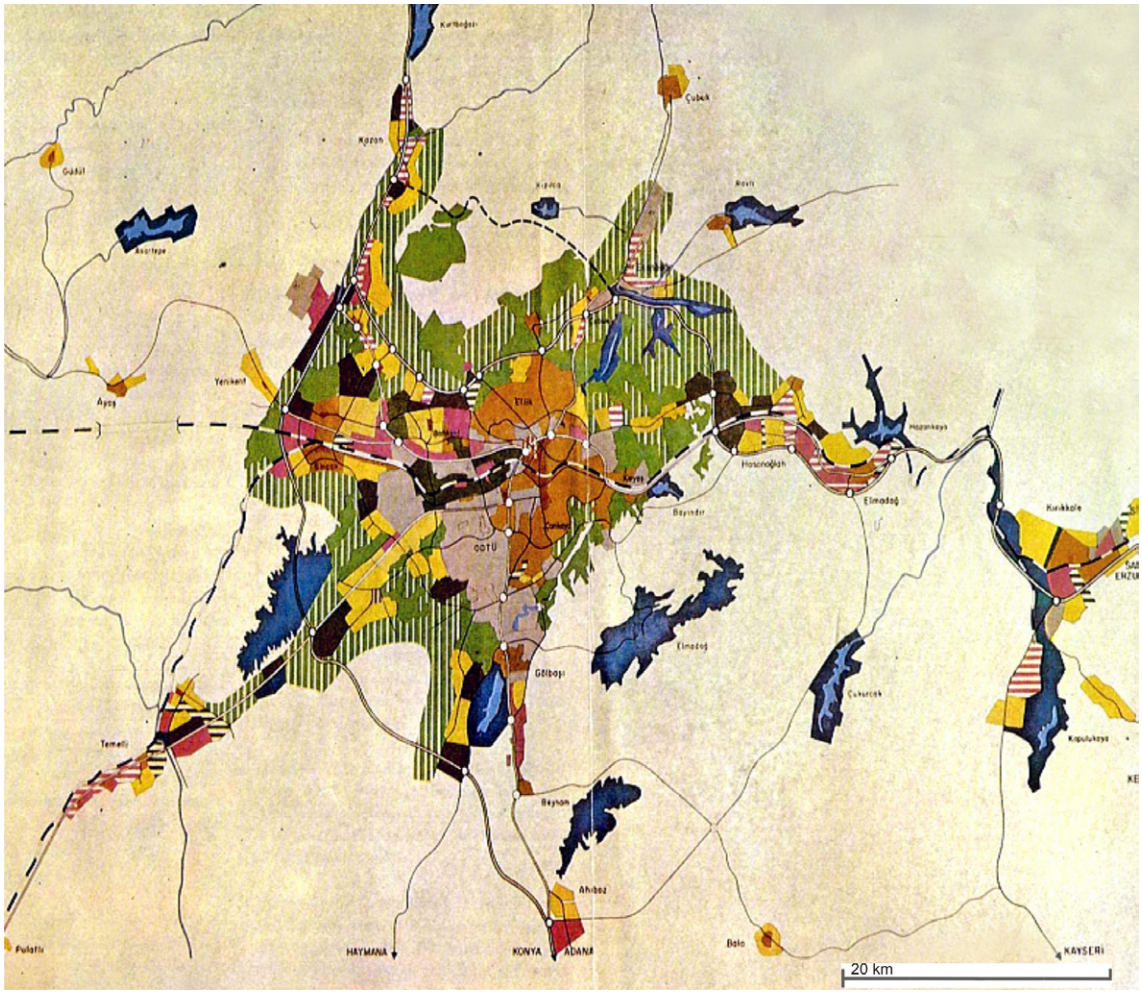


Fig. 9: Urban macro-form schema of *Ankara 2015* (Source: Harita ve Plan Belgeleme Birimi [Maps and Plans Documentation Unit, Faculty of Architecture], 2007).

car ownership and the new planned developments outside of the city fabric would give way to the third and final phase of macro-transformation, which was partially based on rapid dispersion (see Figure 2). This trend did not evolve from necessity, but mainly from the increasing number of private entrepreneurs demanding partial urban developments in the fringe of the city from the early 1990s. Disturbing the balanced population pattern and technical infrastructure of the city, the new tendencies made it necessary to have a new master plan to react to the ongoing demands of the housing market. Actually, such a condition would be presumed given the maturation period of the country's neo-liberal macro-economic transformation in the years after the 1980 military intervention. Within this context, the proposal for the Ankara 2025 Master Plan was prepared by the planning office of the municipality in 1997.[45] Although it was not officially approved, the Ankara 2025 Plan is worth evaluating as the fifth master-plan schema of Ankara because of the prevailing planning ideology it represents.

The main plan principle of Ankara 2025 was the amelioration of an unbalanced distribution of population by redistributing it, through the decentralisation of congested/cramped functions in the existing urban fabric and the creation of new nodes, corridors, axes and attraction centres.[46] As the dominant growth policy, the peripheral expansion envisioned by Ankara 2025 was not bound by real limits, whether functional or physical. The prevailing tendency was to allocate almost all developable locations in the outskirts of the metropolitan area to urban development without any significant development criteria being defined by the master plan. This strategy was not related to the existing urban fabric: for instance, optimum distances from the central city, a factor which is quite critical to the future costs for service provision by the local government (the lengths of additional technical infrastructure, mass-transportation service lines, etc.) were not taken into account. However, the development process has been shaped by the partial fulfilment of market demands without the macro-rationale of a comprehensive phasing of development.

The plan was burdened by inconsistency, both in supporting peripheral development in extreme cases and in accepting immense population increases within the inner city. These increases came about through the reclamation plans of district municipalities, which transformed low-density squatter areas into high-density regular housing areas with the stereotype of apartment point blocks. [fig. 11] Finding its roots in the reclamation plans produced for the squatter zones from the mid-80s, today the second phase of the so-called planned transformation of the informal periphery is being realised in a vast area of urban fringe. In this way the 'marginal' periphery would be demarginalised by assimilation through a radical gentrification process. The rapid transformation triggered by the plans is realised without any social resistance from the people living in these 'marginal edges'. Increasing rents for urban land, an aspect of this transformation process, have been highly welcome by the families living there and perceived of as an opportunity for legalisation by the state.

The Ankara 2025 Plan schema contains no indication of considerations for directing urban form and shaping city structure. Therefore, it is difficult to classify and define the urban form and structure suggested by the plan. Furthermore, it is difficult to rationalise the plan decisions in terms of optimum city size and the gross-density criteria for the new development zones. As an amalgam of the previous partial development plans for new growth, the plan did not produce an explicit urban transformation strategy for the existing urban fabric.

Furthermore, the plan process, encouraged by the partial plans (which are not necessarily a substantial part of a large-scale development) were mostly comprised of a small number of building blocks

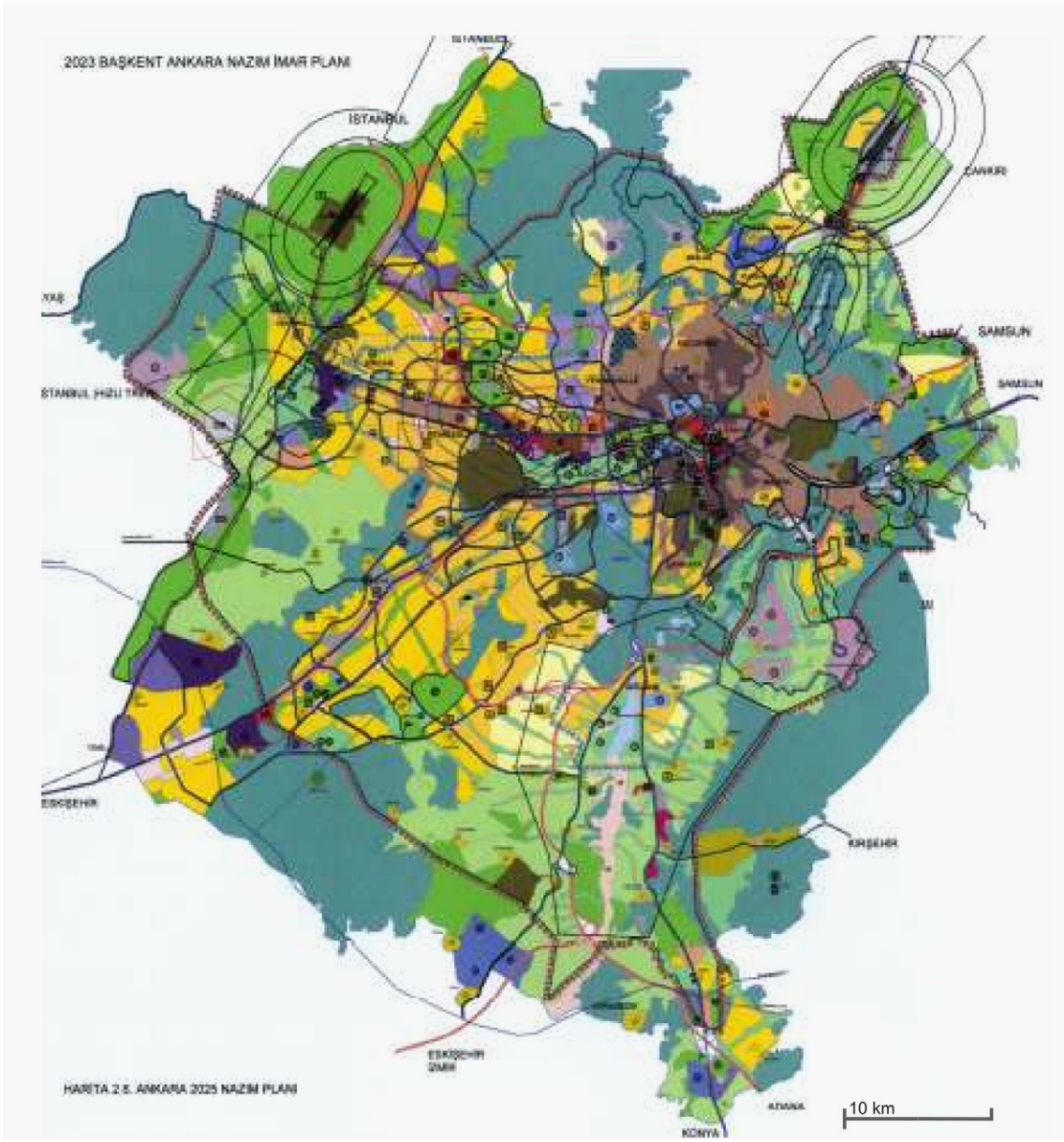


Fig. 10: Ankara 2025 Master Plan Schema (Source: ABBISDB, 2006).

constructed by small housing cooperatives. Then the idea behind the planned corridor developments was sacrificed to the dominant trend of market-led, fragmentary peripheral development. Instead, a star-shaped development pattern was deformed by the further medium- to low-density settlement nuclei in the periphery. It can be regarded as a return to the conventional ink-blot development process of Turkish cities. In other words, it was a realisation of the *formlessness of urban form*. 'Formlessness' here is the condition of the free-market urban economy explicitly depicted by the plan.

Thus, the Ankara 2025 Master Plan can be regarded as a trend-responsive and development-oriented plan type, which has been typical of Turkey's experience in the past twenty years, as it strives to adopt a free-market economy in an unprogrammatic way. The main feature of this planning approach is a disregard for large-scale planning rationales - holistic development patterns for the sake of social and physical integration at a macro-scale or increasing accessibility levels, etc. - with prioritising market rationales based on maximising urban land rents by further developments without any comprehensive projection for the city and regions. The prominent risk of this condition is the emergence of an urban composition which cannot go beyond the 'sum of its parts' in Gestaltic terms. As observed by the scheme [fig. 3], the clear image of the city at the level of macro-form has been highly disturbed by the partiality of city transformation. The urban form, which is still evolving according to current conditions, rather than being formed, can be defined in this framework. This is the reason why the city form is inevitably being shaped without responding to basic sustainability requirements such as spatial coherence between the core and periphery.

2023 Başkent Ankara Master Plan (2006): *Managing growth*

The early 2000s represents the maturation period of the third phase in our model, which began with the previous plan's term. As noted in the introduction, the central government has directly engaged in the production of mass-housing through its dedicated agency (TOKI) and initiated large-scale transformation projects, such as redevelopments in the informal housing areas at the edge of the city and new development projects in the fringe. This was the spatial consequence of the emerging macro-economic policies of AKP, the ruling neo-liberal party in Turkey.[47] The dynamic character of the periphery has been responded to by another type of dynamism in the core city, with a series of infill projects in the form of high-rise office spaces and shopping centres along the main inner arteries in accordance with the growing demands of the real-estate market. This transformation in the core has been achieved at the expense of large-scale transport operations to make the confined core much more accessible. The process has been led by a 'radical urbanist' perspective, one which is willing to manipulate existing structures in a destructive way.[48]

In these years, the capital city of Ankara met the new period without a master plan. Since the Ankara 2025 Master Plan schema was not approved as the legal master plan of the city by the Ministry of Public Works and Housing,[49] a new master plan became a real necessity from the late 1990s. After a new juridical regulation the Metropolitan Municipalities Law was enacted by the national parliament, the metropolitan municipalities were given the right to prepare 1/25,000 scale development plans in 2004. Before the regulation, the plan-making authority of the metropolitan municipalities was limited, with development plans at a scale of 1/5000. The Ankara Metropolitan Municipality would direct the increasing size and scale of the metropolitan development through a master plan. In accordance with this legal right, the planning department of the metropolitan municipality of Ankara prepared a new master plan in 2006: the *2023 Başkent-Capital-Ankara Master Plan.*

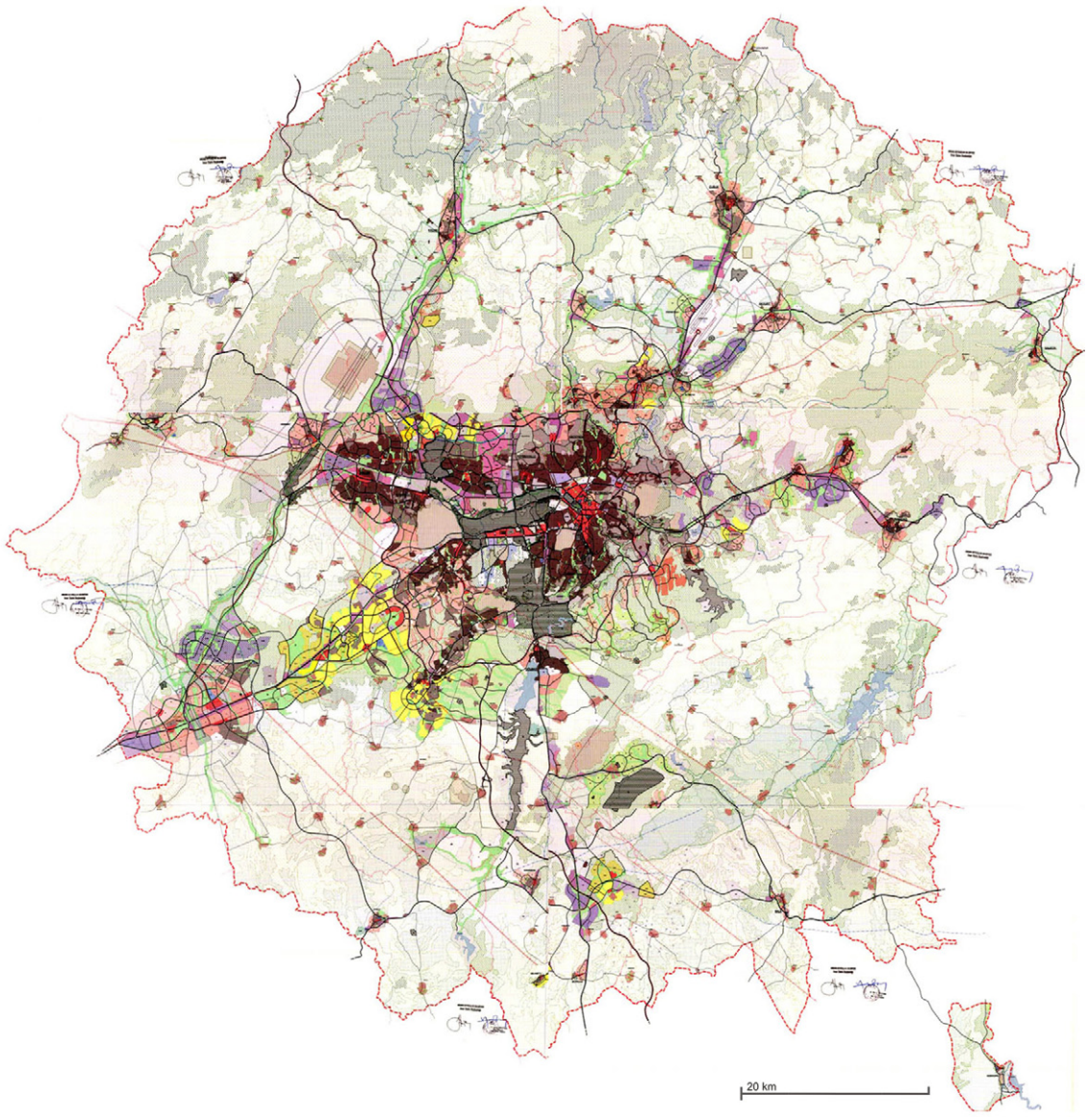


Fig. 11: Transformation of an informal peripheral area into a regular planed urban zone between the years of 2000 and 2005: *superimposition of a typical plan layout onto the organic settlement tissue of the squatter area.*
Fig. 12: 2023 Başkent Ankara Master Plan schema, 2006 (Source: ABBISDB, 2006).

The plan's chief difference from previous ones is that it does not reject further development categorically or trigger uncontrolled, fragmentary and speculative development tendencies. The end result was not the neither/nor condition to be expected from a master plan, but a reasonable compromise between centrality and decentrality at the metropolitan level by managing growth.

The originality of the plan also derives from the process, which was realised by the planning team of the municipality. Rather than defining an overall structure of the future city, the plan-making process describes another way for mastering the whole body of development. Ankara 2023 Master Plan represents a kind of bottom-up approach, combining 15 different development plans produced by the different local municipalities within the entire Ankara metropolitan area. The master plan, however, is not just a collage of those lower-scale plans. What the planning team had done was to revise all plans according to the overall structural perspective of the master plan. In this way, spatial coordination among the partial plans was ensured. To control the enduring speculative development trend - mainly based on housing for medium-high to high-income groups - triggered by the local initiatives, the total population projection within the entire area governed by those plans was decreased from 13 million to 6.5 million. This was accomplished through a series of plan revisions such as the reappraisal of density surfaces and cancelling excessive development extensions.[50] Only this point is a clue to the market-driven nature of development plans today in Turkey. The plan also provides a radical intervention to eliminate the ongoing developmental dynamic in the urban fringe, one that had been threatening agricultural land, water reservoirs and forestry areas for years. From the time of its inception, the master-plan approach became separated from the prevailing neo-liberal macro-political wing of the country.

While structuring the main development corridors according to the existing settlement composition and natural thresholds, the plan does not set out to produce a blueprint to be followed in detail. Instead it defines six different sub-regions and develops specific planning and design programmes according to their intrinsic urban and natural peculiarities. Then, within those regions the overall settlement fabric is defined as either development zones or as the existing fabric. Unlike the previous examples, this intervention process within the urban core is characterised by preservation, rehabilitation and transformation zones which tend to be located within an overall framework.[51] Departing from a simplistic location choice practice, the plan proposes specific 'transformation action plans' for each zone. In this respect, it was the first time for the city of Ankara that the urban core was defined by a series of different intervention zones within a master plan. If it is realised in the plan implementation process, alternative spatial and social organisation, counter to the stereotypical transformation of informal settlements, can be achieved.

The most important point about the urban periphery addressed in the 2023 Başkent Ankara Master Plan concerns altering the dominant development mode in newly planned settlements. First, as opposed to a parcel-based formation, which is dominant in Turkey today, the plan encourages 'block-based plan implementations' within new developments.[52] The drawback to this positive intention is that it does not define any principles for a design coding system for such a significant differentiation in urban space production, other than to refer the issue to lower-scale plans without a binding condition. Furthermore, the block level is not enough to create legible, harmonious and coherent urban patterns, which are lacking in almost all Turkish cities today. For that reason, the minimum control unit to be defined has to be at the level of the urban ensemble. Secondly, the proposal to phase in extensional development is another crucial issue for the urban

periphery.[53] Although it can be seen as a procedural issue, phasing has significant potential to overcome the continuing fragmentary development patterns in the periphery of the city.

The vision and target definition of the plan clearly state that the plan schema seeks an integrated and compact type of macro-urban form in order to make urban public infrastructure investments feasible.[54] On the other hand, what the plan proposes regarding compactness remains at the structural level by ensuring the holistic Gestalt of the development segments of the city, which are to be interconnected by the transport connecters. Compared with the previous plan, this is a relatively positive asset; however it lacks the major formal characteristics of urban compactness - density, coherence and mixed-usage - which are critical at the intermediate scale.[55] In the plan report, a clearly doubtful approach to the density issue can be observed. For the new development zones, the maximum density level is determined as 'mid-density' (60-100 people per hectare)[56] without regarding the possibilities of well-designed high density measures as a criterion for sustainability. This is very much an indicator of the enduring perception of urban density by Turkish planning circles, because of the powerful image of the modern Turkish city core which has suffered greatly from ill-defined, high-density layouts.

Another indicator of the plan's moderate position between centrism and decentrism is its consideration of extensive, campus-type open areas and large green zones as constituent parts of the macro-urban form, in opposition to ink-blot, pseudo-compact urban formation.[57] Unlike some others in the past, it does not offer a large-scale green system for the organisation of the metropolitan form. This is basically because of the increased surface area of the plan (8500 km2), in which it is too difficult to code 'voids' without significant planning tools for land control.

Despite all its apparent handicaps and strengths, the 2023 Başkent Ankara Master Plan will require time to be evaluated with reference to the mid- and long-term results of the current plan implementations. Even though the capital's present local government would rather direct the dynamic process of the final phase of evolution through a number of incremental projects without any reference to the master plan (conforming to a conventional, neo-liberal reaction against the idea of planning), the importance of the last plan stems from its large-scale effect and its macro-approach to the (re)formation of the capital.

Conclusion

This short planning history of Ankara provides a substantial set of lessons for similar types of rapidly developing and transforming cities. First of all, reading master plans is fairly relevant to understanding the dynamics of urban form and formation in developing and transforming countries. A historical perspective has real potential to be utilised in planning policies. Revealing the major determining factors in the control of the macro-urban form in the context of highly elusive and ephemeral social, economic and political externalities enables planners to revise ongoing policy directions in master planning.

Nevertheless, such a reading should not be based on academic criticism, derived from purely conceptual idealisations. Especially in the case of developing democracies, planning practices are under the direct influence of local and national politics and emerging market forces. Resistance to these 'external' factors, all of which must be taken into consideration in the planning process, may not be easy for planners in cases when there is a contradiction between political directions, market rationale and planning principles. This is clearly observable in the formation of capital cities, which are the focus of large capital investments and political symbolism, as in the case of Ankara.

The main contradictions are constructed from the basic dichotomies which characterise the ideological positioning of any master plan. The main dichotomies we find in the correlation between the macro-urban evolution and master-planning perspectives in the Ankara case are:
- old vs. new (historical vs. modern)
- conservation vs. transformation
- formal vs. informal
- city vs. nature
- proximity vs. distancing
- integration vs. segregation
- growth vs. regeneration

These are the factors which transform the action of form control at the macro-level into a political phenomenon. Each dichotomy gains a different level of importance in each specific phase of the evolution of cities. In this case, master plans have to make a trade-off within these dichotomies in order to specify their future direction. Nevertheless, there is a certain dichotomy which manipulates the other ones, spatially: *core* vs. *periphery*. An explicit domination of one over the other determines the basic ontological position of any master planning schema in terms of the dichotomies mentioned above. This the reason why it is argued that the first criterion used to evaluate any master plan should be its principle proposition on core and periphery. The different forms of the reproduction of these two entities are subject to the design domain and open to new interpretations. This actually makes master planning an innovative action area.

Since each innovation is based on a paradigmatic shift and leads later ones,[58] evolving approaches on master planning are also sensitive to new paradigms, to be re-interpreted in different cases. On the other hand, any paradigmatic shift in planning may not always find its applicable basis in reality. In developing countries this state is much clearer. As we see in the Ankara case, the planning profession, which is active in master-planning practice and engaged with the 'universal' terminology of planning, may experience difficulty in operationalising Western-oriented planning concepts (i.e. 'garden cities', 'decentralisation', 'urban transformation') in their original forms in the new context. This is basically the common contradiction experienced by the intelligentsia of any developing country. Yet, for planners this contradiction is not only an intellectual problem, but also, and principally, an ideological one. Considering the macro-dynamics of urban formation, mainly directed by the dominant mode of production, mobility and politics, we see planning either in a state of resistance to or conformity with the macro-trends. In spatial terms, these two states of being manifest themselves through the basic dichotomy between core and periphery in the name of *centrism* and *decentrism* in master planning. This reading of master plans (within this spatio-political perspective) claims to provide a proper way to define them in a broad context, beyond the limits of a technical point of view.

Another conclusion we can infer from the master planning experience in Ankara is that during the evolution of urban form the emergence of the nuclei of the core to embody its periphery, not only the scale of the entity but also its complexity level progressively increases by the asynchronous differentiation of the sub-segments of the entire body. This diversification in spatial form inevitably demands a differentiation in the conventional forms of plan interventions. As is seen in the Turkish case, planning tools and control mechanisms can sometimes be incompatible with emerging socio-spatial dynamics and the urban forms created by them (i.e. squatter housing after inner migrations, or the high-rise financial districts/corridors created by an emerging real-estate market). In these cases, the master plan falls behind the dynamic process and loses its control over form. To transcend this problem, the master planning process in rapidly developing countries should combine two areas: growth management and urban architecture/design.

While alternative programmatic approaches need to be produced for specific city sections with regard to their location in the core or periphery, these programmes should be elaborated by the associated specifications of urban patterns. Considering the dynamic character of 'developing' urbanisation, this approach should be typological and flexible enough to properly handle any sudden future orientations. This perspective requires a new framework, combining large-scale programming and an intermediate design scale.

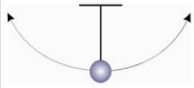
In this context, the question of bottom-up vs. top-down is still valid. What we clearly observe, not only in the case of Ankara but also in other modern cities, is that the master plans steering the formation of cities are not capable of ensuring spatial quality by defining the overall form at once (like the early modernist master-plan schemes) or only by defining the macro-structure without an explicit formal characterisation of the parts (as in most strategic plans). This is why a new master-planning perspective should be sensitive to bottom-up formations, designing compositional rules at an intermediate scale while simultaneously controlling the constitutional structure (not the form) of the entire metropolitan body through growth management. This is especially important to the creation of robust forms and patterns which are subject to destructive transformations in rapidly developing cities (i.e. the inner city transformation of Ankara).

In terms of the ongoing trend towards the fragmentation of urban form by uncontrolled, piecemeal transformations and developments, an alternative master-planning approach can be found in the thoughts of Christopher Alexander, who declares the fragmentary growth pattern,

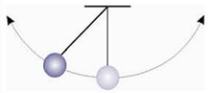
to be piecemeal in the bad sense, incoherent, scattered, fragmented. It tends to produce aggregations and assemblies…instead of coherent wholes. To solve this problem, it may be necessary to use still more powerful methods of generating large wholes, and linking them to the piecemeal process.[59]

From this point of view, turning the current problematic condition of cities experiencing rapid and fragmentary development into opportunity would seem to be a difficult but not impossible planning mission. What is needed is basically a new understanding of 'mastering city form'. In the search for wholeness between the core and the periphery, conventional large-scale master planning has proved to be insufficient for shaping the urban environment within a system of coherent and complex fragments. Therefore, instead of searching for the old power of master planning for the sake of total control, redefining large-scale planning with context-sensitive morphological design approaches seems relevant in our current context. The fragments would no longer be fragmented, but would perform as the constitutional parts of a holistic structure of metropolitan urbanity.

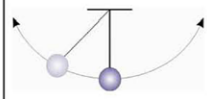
In this regard, for the definition of the typology of urban form and patterns, master plans should take into consideration the locational characteristics of the fragments, in terms of core and periphery. This is the point where urban architecture and master planning come together. Otherwise, the intermediate scale design with no link to macro-transformation dynamics would end with an unexpected force of transformation as is often experienced in 'developing' urban contexts. In this framework, the design challenge becomes one of innovating compatible types of patterns according to their macro-locations (core and periphery), while the challenge of planning emerges as mastering the fragments within a coherent whole of the metropolitan structure.

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 Jansen Plan (1932)	Rapid urbanization	Statist	300,000 45-year	4 km	

City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Quasi-Core City	Consolidated Well-defined bounded Organic Mono-centric Permanent Inward-looking	Horizontal development within the plan boundary	Development and infills within designated urban lands by housing cooperatives.	140 p/ha	Low-density low-rise housing (detached villas in garden city model-environment) in the main body of the new city. 

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 Yücel-Uybadin Plan (1957)	High population increase by migration	Populist	750,000 20-year	15 km.	

City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Extensive Core City	Intesive Centralized Close-knit Mono-directional Confined Continuous	Vertical Compaction Intensification in inner city	Meeting housing demand by increasing densities in the existing settled area with additional development rights	189 p/ha	High-density, high to medium-rise coarse grain housing settlement pattern. Apartment buildings at individual parcels within typical narrow rectangular building blocks. 

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 Ankara 1990 Master Plan (1975)	Decreasing rate of urbanization after the late-1970s	Social-democrat	2.8-3.6 million 15-year	25-30 km.	

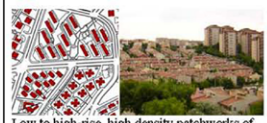
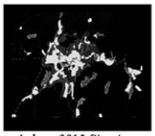
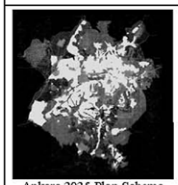
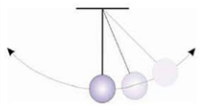
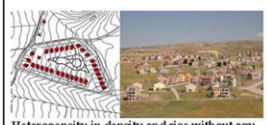
City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Corridor/ Quasi Linear	Linearly extended unbalanced total layout Inflexible (axis dominancy) Increased surface relation with the surrounding Greenbelt	Corridoric extension	Expropriation of large lands by local authority, then the development by mass housing cooperatives.	200 p/ha	 Low to high-rise, high density patchworks of road bounded housing clusters.  Medium to high-density modernist housing with courtyard type common space encouraging open system development

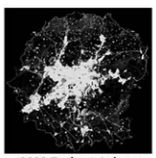
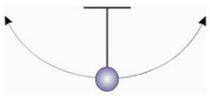
Table 1: Characterisation of master plans for Ankara with reference to their prevailing socio-political context and major formal/structural features.

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 Ankara 2015 Structure Plan (1986)	Stabilized urbanization -Increasing tendency for the escape from the city (sub-urbanisation)-	Social-democrat & Neo-liberal	5 Million 30-year	35-40 km.	

City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Star-shaped	Decentralized Flexible Penetrations in to periphery Green-wedges	Concentrated decentralization through main transport corridors	Directing private housing sector and public institutions by plan initiatives without any expropriation.	130 p/ha	 Medium to low density mid- and high rise development -not exactly coded by the plan-.

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 Ankara 2025 Plan Schema (1997)	Speculative urbanization	Neo-liberal	7.2 Million 28-year	60 km.	

City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Dispersed	Scattered Fragmented Diffused Multi-nucleated Ad hoc Non-centric Elusive	Concurrency of dispersion and inner densification	Meeting partial development requests of housing sector in an uncoordinated way.	50 p/ha	 Heterogeneity in density and rise without any holistic system of an urban pattern. Inwardly oriented housing sites at the periphery and  Coarse grain apartment block development in the inner transformation zones of the city.

MASTER PLAN	Urbanization phase	Prevailing political atmosphere	Projected population & time interval	Depth of control (r)	Spatiality Centrism vs. Decentrism
 2023 Baskent Ankara Master Plan Schema (2006)	Speculative urbanization	Neo-liberal	6,5 Million 16-year	60 km.	

City structure	Urban form	Main policy direction	Development strategy	Average urban density	Settlement type
Corridor & Urban Galaxy	Multi-polar Stretched Mesh of fragments	Structuralization of uncoordinated piecemeal development zones.	Re-assessment of the partial local plans according to the holistic structure of new metropolitan form.	40 p/ha	?

* This paper is a revised and improved version of a paper submitted to the 4th ISUU International Conference held on 25 September 2007. See: Çalişkan, O., 'Rethinking on the Peripheral Urban Formations in a Semi-Peripheral Country: the City of *Ankara, the Capital of Turkey*', in: Bruyns, G. et al. (eds.), 4th International Seminar on Urbanism and Urbanisation: *The European Tradition in Urbanism and Its Future*, (Delft, The Netherlands, 2007), pp. 223-231. The paper was based on the 2004 MSc dissertation published in 2009. See: Çalişkan, O., *Urban Compactness: A Study of Ankara Urban Form* (Saarbrücken: VDM Verlag, 2009).

Notes

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4. Ibid.
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Biography

Conducting his PhD research at TU Delft Faculty of Architecture, Department of Urbanism, in the Netherlands, Olgu Çalişkan is a research assistant at Middle East Technical University (METU) in Turkey. Having got his MSc degree on Urban Design at METU in 2004, the author is currently studying on the issue of 'pattern formation in urban design'. His recent publications include a book on 'urban compactness' (by VDM, 2009) and several articles including Journal of Urban Design (forthcoming, 2009) and METU JAPA (2006/2). His main research interests are physical planning and design, urban morphology, urban design theory and method, and visualization in urbanism.

The Landscape Form of the Metropolis

René van der Velde and Saskia de Wit

Much of what contemporary urban form is today, exceeds the comprehension of the conventional urbanism and architectural repertoire. The distinctive physical characteristics of the city and its districts have been replaced by an urbanised field made up of indistinct, fragmented territories. The spatial character of these urban fields clashes with ideas of harmony, co-operation and order to be found in traditional urban models. Through the lens of the Metropolis however, much of what is not clear about this new urban condition can be qualified. The metropolis is an unstable, dynamic environment in which elements of the contemporary city re-array themselves in an urban-landscape system. Ordering, composing and acting in this system places a new responsibility on landscape. To what extent landscape, in the sense of the permanent underlying substructure, or visual, physical and conceptual open space and as a conceptual and instrumental 'vehicle' of nature, has a bearing on the elaboration of the metropolitan repertoire is the broader field of inquiry of the research programme of Landscape Architecture in Delft. The overall intention of the research is qualitative; it is guided by primary objectives of the spatial design disciplines: the understanding, definition and development of spatial quality. The aim is to distil instruments from both the landscape 'lens' and the underlying landscape itself, in order to replace or add to the classical understanding of city form, given its increasing shortcomings in dealing with the contemporary spatial problematique.

In this paper the dissection of the landscape-architectonic treatment or 'action' and the discovery of archetypes derived from landscape-architectonic practice are explored. A first step in reaching an alternative metropolitan repertoire is the redefining of landscape-architectonic archetypes for metropolitan transformations in abstracted spatial terms, removed from scale, programme and meaning. In 1995 Clemens Steenbergen, Wouter Reh en Peter de Zeeuw laid down a tentative theory in order to describe new urban territories in abstract terms, reducing contemporary urbanisation patterns to points, lines and planes. This resulted in three basic forms: the flow landscape, the plantation and the landscape theatre.[1] The potential of this theory for the contemporary metropolis is significant, but its elaboration and testing has to date received little attention. In this paper we intend to scrutinise these basic forms and place them in the perspective of the development and discourse of the metropolis.

Viewing urban history from a landscape-architectural point of view we can define a sequence of moments from which the archetypes for these basic forms are derived. Studying the successive stages we can discern four conditions for the development of a comprehensive urban-landscape system in a formal and spatial sense. In the metropolis the different stages, conditions and forms will usually overlap in space and time, as a result of which combinations and confrontations of landscape-forming forces that give a special dynamic to the metropolitan landscape architecture can be generated. Placed in an historical perspective, the development of the

metropolis can thus be understood as a logical progression *away* from the notion of city as artefact and *towards* the city as landscape. In addition, spatial archetypes grounded in landscape architectonic practise can be shown to emerge out of this development.

The interplay between the basic forms can breach the scales defining the landscape and endow the metropolis with architectural form. The next step involves finding motives from which we can distil models for the staging of the metropolitan composition. These models are vital tools in the choreography of the metropolitan landscape and can be found within the landscape itself. When the city disintegrates into an archipelago of fragments a new role is also imposed on the landscape as a carrier of topographical characterisations, cohesion and continuity. The underlying landscape layer contains an annotated catalogue of situations, in which the *genius loci* is recorded and secured. These latent compositional elements can be transformed into landscape architectural compositions within the topography of the emerging metropolis.

Three cases will assist to highlight the role of these basic forms in the discourse of the metropolis as a compositional problem: Los Angeles, widely recognised as a textbook metropolis, the Randstad, where the concept of the metropolis is mainly seen as an unfulfilled task, a 'possible transformation from the current loose collection of villages, towns and cities in the delta of the Rhine and the Meuse into a coherent urban system of stature, a European metropolis',[2] and the metropolitan area of Hampstead Heath in London.

The metropolis as a compositional problem

Through all of urban history, from Jericho to Marne-la-Vallée, it has been common practice in the perception of the city to view the city as a whole, no matter what concept to describe the city is used. The different concepts can be categorised into three 'normative' models, as Kevin Lynch analysed in his book *Good City Form*: the cosmic model, the city as a spatial diagram of social hierarchy as an interpretation of the universe; the practical model, or the city as a machine, a functional construct of interrelated parts; or the organic model, an indivisible, living organism.[3] What these models have in common is that the city is always viewed as a whole, as an artefact placed against the background of the non-city, determined by the way it is distinguished, separated from its environs. 'The city always assumes another (outside) world, that of the landscape in which the ideal image of the city can be projected. The historical footprint of the city is a definite limited space in an indefinite, limitless landscape.'[4]

In contrast to the territorially limited city is the concept of the metropolis: an unstable, dynamic environment in which elements of the contemporary city re-array themselves in an unbounded urbanised territory. The spatial character of these territories clashes with ideas of harmony, co-operation and order to be found in traditional urban models. In western cultures, these models stem from a collective 'consciousness' of the ideal form of city and landscape and are rooted in historical precedents. Continuity and harmony are the primary ingredients of utopias and these continue to qualify our ideas of urban space. In metropolitan territories, the continuity and composition of the classical city would appear to be replaced by a *contiguity* of urban forms: a stacking of programmatic entities side-by-side.[5] Several design theories and models dealing with contiguity have seen the light of day. In his analysis of the transformation of the urban fringe of The Hague, Neutelings depicts the metropolitan territory as a carpet of urban fragments devoid of compositional form.[6] The continuity and compositional logic of the city is argued to have been replaced by a contiguity of elements and networks in the metropolis. OMA's scheme for the Parc de la Villette competition in 1982 proposed contiguous banding and layering as an alternative to composi-

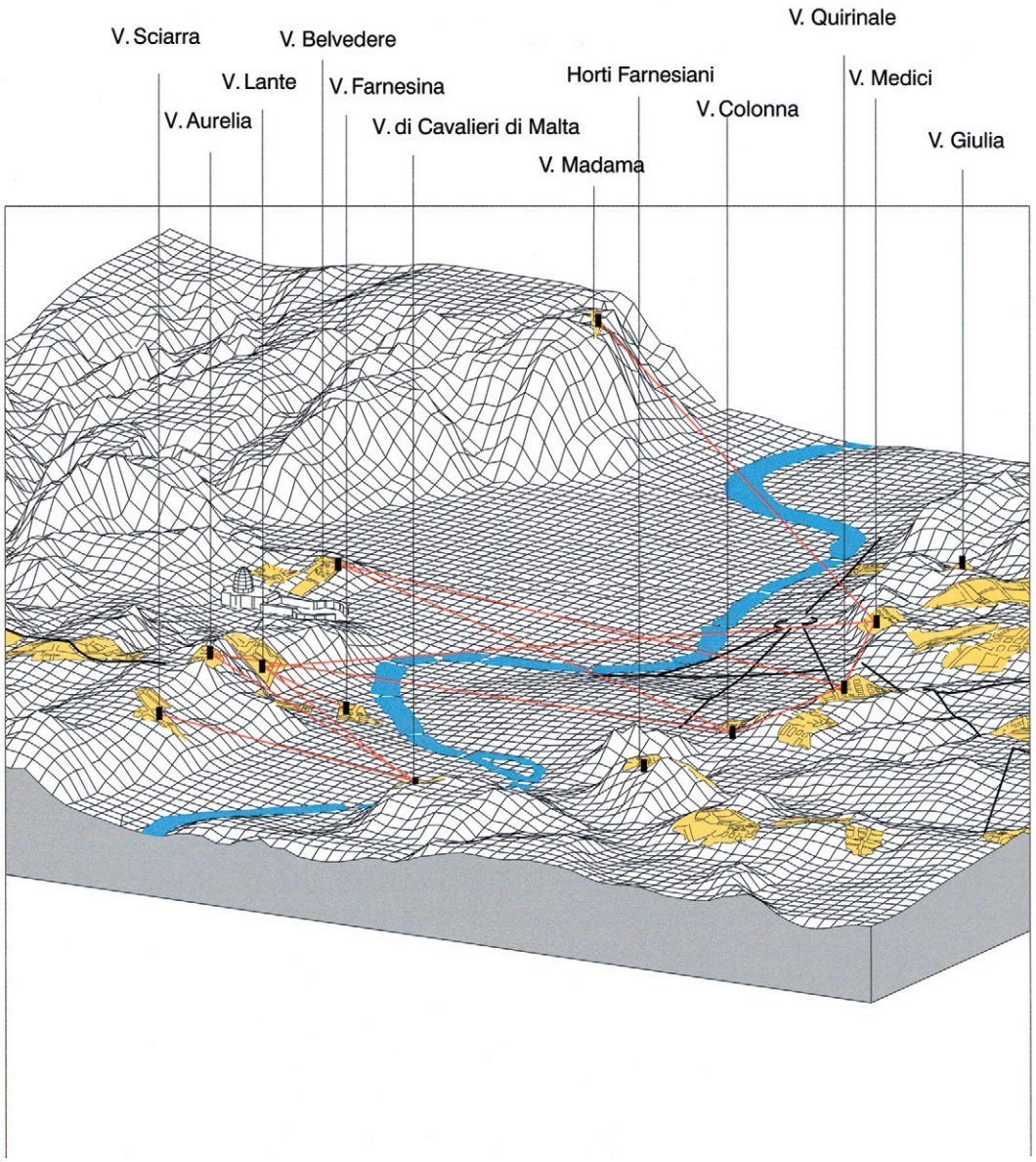


Fig. 1: Landscape and Metropolis phase 1: the unlocking and architectonic integration of city and landscape by means of the country estate. Rome and its villa landscape. Clemens Steenbergen and Wouter Reh, *Architecture and Landscape: The Design Experiment of the Great European Gardens and Landscapes* (Berlin, 2003) p. 17. Drawing Hans van der Horst.

tional continuity and formal and spatial ensembles and was inspired by similar conclusions about metropolitan form.[7] The apparent non-compositional contiguity of metropolitan territories however, can be shown to be relative to the context within which the territory is perceived. Within the context of an (architectonic) language of composition rooted in utopian city models, they can be considered lacking in compositional continuity. Within the context of an architectonic language rooted in landscape practise however, they can be seen to be compositional, or composable. The evolution of the metropolis *away* from the notion of city as artefact and *towards* the city as landscape defines this difference.

The evolution of the metropolis

The change from a city in the landscape to the city as a landscape of fragments is generally considered a contemporary development. When viewed as a collection of landscape-architectonic transformations however, the metropolis may be considered as a city that has gradually opened up to the landscape, on all scales and in different forms over a much longer period of time. The development from the Western-European medieval city to the present-day metropolis can be broken up in four stages of the spatial and architectonic 'opening-up' of the city.[8] This classification is not aimed at a complete historical overview or at a historical classification of the large variety of landscape-architectonic elements, but at the distinction of essential steps and prototypes that drive the metropolitan process. Each stage plays its own role in the spatial definition of the city-landscape relationship. Each can be viewed as an addition to the formative 'force-field' of the metropolis, leading to a comprehensive urban-landscape system as a spatial and formal composition.

In the medieval city primordial urban landscapes, such as the town garden or vegetable garden as a private domain and the garden as a public space or cemetery next to churches or institutes, formed the stepping stones in the functional relationship with the landscape and with nature. Beyond the city walls the city meadow, the archers' field, the bowling alley and the menagerie formed their counterparts in this relationship, as elements of leisure and entertainment. From the Renaissance onwards, the landscape territory of the city was opened up architecturally and new urban landscapes were created, such as the villa, forecourt, botanical garden, plantation, square, city walk and city woods. This could be viewed as the first stage of the metropolitan process: the introduction of an Arcadian territory in the form of a country-estate landscape in the urban hinterland.[9] [fig. 1]

During the course of the 19th century the city perimeter gradually dissolved, opening up the city to the surrounding landscape. The expansion of the modern city into this landscape came about using a new repertoire of landscape-architectonic typologies. As compensation for industrial exploitation, nature was elevated to a separate cultural category. This resulted in the invention of parks, such as the public park, the national park and the nature reserve, in which the cult of nature could be celebrated. The city park was included in the city in a planned manner, as 'artificial nature' and as public facility. It was given form through a series of experimental transformations of the English landscape garden. Reconsidering the position of the house and organising it serially could transform the landscape garden into a villa park, a common landscape-based form of living in the city. Through an intensification and differentiation of the routing system the landscape garden could be transformed into a public promenade park, which integrated in an organic manner into the street grid of the city. Through the defining and differentiation of the programme the landscape garden could be transformed into a public park as the centre of urban recreation in nature. Thus the expansion of the open city into the landscape, the opening up of the city perimeter with the city park as a colonisation model, can be distinguished as the second stage of the metropolitan process. [fig. 2]

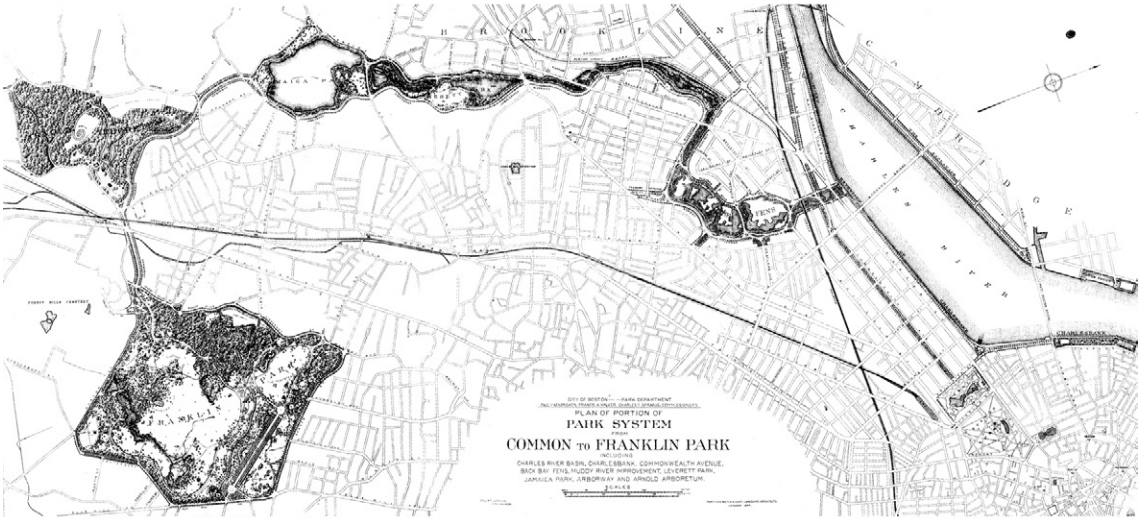


Fig. 2: Landscape and Metropolis phase 2: the opening up of the city perimeter with the city park as a colonisation model. Central Park New York. Photograph by Marie-Laure Hoedemakers.

Fig. 3: Landscape and Metropolis phase 3: the park system as an urban framework within the open body of the city. The Emerald Necklace of the Boston park system. Design Frederick Law Olmstedt and Charles Eliot, 1894-1902.

By considering the public park as a link in a series or as a potential framework for new urban expansion, the park system, the parkway and the park city came into being. In the 20th-century garden city the public green appeared as an 'interim space' and remedy for the increasingly inaccessible landscape. Programmatic and ecological aspects were mutually cohesive. The programme of this structure artificially encompasses the 'entire' landscape with, among other things, the allotment, the playground, the sports fields and the cemetery. The green belt was a last heroic effort at keeping the city organised and the landscape accessible. As an unformed buffer zone without an architectonic strategy this green belt marks the boundary of the urban landscape as a landscape-architectonic intervention. This makes the implosion of the city perimeter and the transformation of a continuous urban grid or street system into a series of urban islands the third stage of the metropolitan process. The process of fragmented urban expansion goes hand in hand with the formation of interim landscapes. [fig.3]

When, as a result of the continuous process of urban expansion and transformation the entire territory ultimately disintegrates and the city becomes poly-nuclear, the difference between city and landscape vanishes. The fourth stage of the metropolitan process can therefore be described as the disappearance of the distinction between city and landscape. City and landscape are united in an 'unlimited' urban field of hybrid intermediate forms. [fig. 4]

Basic landscape forms

In the opening up of the city, landscape-architectonic archetypes emerge that are unmistakably urban but at the same time belong to the landscape, the non-city. They don't have a place in the dichotomy of city versus non-city, but are already giving shape to the comprehensive urban-landscape system of the emerging metropolis. Reduced to their formal and spatial properties they constitute basic or archetypal forms that also qualify the spatial condition of the present-day metropolis. The city walks, parkways and the green structures of the 20th-century expansion plans are linear structures with a narrative structure, 'that bead living, working and infrastructure into a bold visual story'.[10] More than just a feat of engineering, these infrastructural lines are seen as a cultural phenomenon where movement is the motor of a physical and visual experience. The view from the road and its position in the landscape are inherent to the traffic artery. Together they constitute a flowscape. [fig. 5]

The different urban forms that emerged through time, from the compact medieval city to the functionally and spatially autonomous urban islands, can be seen as forms of a colonisation grid with an ordering principle based on the urban programme of dwelling, work and leisure, *plantations*. [fig. 6] In contrast, the medieval public gardens as well as the public parks, the national parks and the nature reserves, the allotments, sport fields and cemeteries are architectonic fragments, defined spaces, voids, where the natural processes are exposed and the landscape horizon is inverted to an internal horizon, perceivable at any scale. Their spatial staging, based on the relationship between the spectator and the spectacle, refers to the theatre; they can be viewed as *landscape theatres*. [fig. 7]

Through the visor of this dissection of the landscape-architectonic treatment or 'action', the discovery of archetypes that are derived from landscape-architectonic practice, we will view two examples that play a role in the current metropolitan discourse, in order to deepen the understanding of these basic forms and test their usefulness for the understanding and design of the metropolitan space and scale. Los Angeles, with its unbridled urban sprawl, inconsequential architecture, freeways, sun, surf and smog is the prototypical metropolis, or at least one of them. One of the most evocative descriptions of the relationship between metropo-

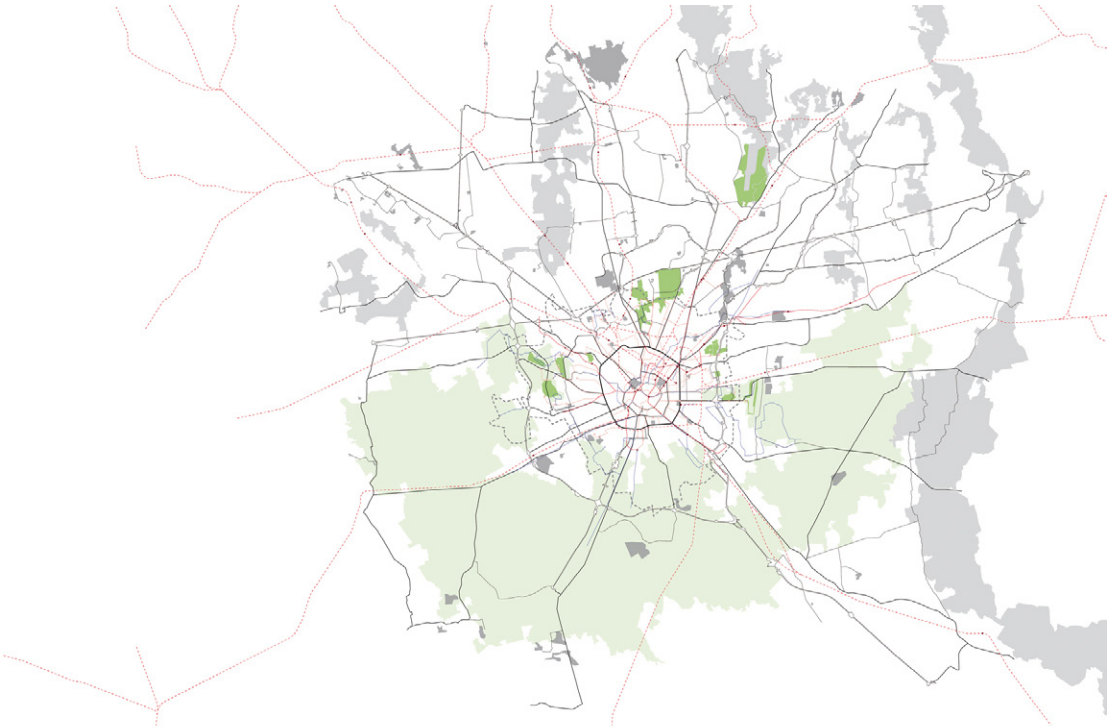


Fig. 4: Landscape and Metropolis phase 4: Urban-landscape continuum, Milan. René van der Velde, *Metropolitan Greens*, Delft (in preparation) 2009.

Fig. 5: Basic forms: flowscape. The gentle curves in the Henry Hudson Parkway in New York generate changing views over the North River. Design directed by Robert Moses, 1937.

unprecedented development along the motorway network of the Randstad since the 1970s. Added to this, the decision in the National infrastructural plan (*Structuurplan Hoofdwegennet*) in 1966 to bypass urban cores when building new highways created the ideal spatial conditions for a new form of urbanisation. Although functionally drawn towards the motorway, the morphology of Dutch cities clashed with the morphology of the motorway zone. From the 1970s onwards the flanks of the motorway became progressively separated from their urban context; although integral to the spatial network of the city, they made no substantial contribution to it. Moreover, urban functions such as housing and recreation didn't mix well with highway noise and pollution. This increasing estrangement from the city (and the landscape) left the repertoire of Architecture and Urban Design - grounded in the static enterprise of the traditional city - high and dry. With some notable exceptions - the Zuid-As in Amsterdam and Leidsche Rijn to the west of Utrecht - the zone was more or less left to its own devices. This condition now defines the majority of motorway corridors in the Randstad area.[15]

Entering the Randstad zone from the east, the conventional set of landscape images from the direction of the Utrecht hills is replaced by another set of images in the zone adjacent to the city of Utrecht. A vast field made up of infrastructural space and greenery interspersed with office buildings, warehouses, furniture halls, car showrooms and billboards flank the motorway on either side [fig.8]. The zone is for all intents and purposes urban but the spatial experience is not. The effect is qualifiable: viewed from the elevated highway vertical elements set off against an omnipresent horizon, contrasting with an urban interior defined by a skyline of buildings. The effect is also quantifiable: seen in terms of area the built form represents only 15% of the total highway zone. The phenomenology of the A12 zone demonstrates the shift of metropolitan transport networks *beyond* both the morphology of the natural landscape and the architecture of the city. Here, infrastructure has become self-sufficient, taking up ever more physical space and becoming visually dominant. The nodes in this network - structural works and roundabouts, intersections with railways and waterways and the sculptural-looking buildings and ensembles of the motorway decor - are not directly bound to the rural and urban topography but constitute a new metropolitan topology. Kinetic perception, the metropolitan dweller's movements by car, tram, train or airplane, and the perception of the urban landscape as it flashes by in visual episodes determine the basic landscape form of metropolitan infrastructure - a space of flows.

How the landscape is perceived depends on the way the route engages the natural, urban and cultural landscape. The motorways of Holland make their way with maximum efficiency through the dense cultural landscape. Agricultural lots are laid out at right angles whenever possible to minimise the loss of land. In the reclaimed polders the road is set low and straight; at their edge it rises to adopt a direction towards another polder where the most expedient direction is often not on axis with the existing stretch. These alignments must be reconciled - hence the gentle curves designed into the route. Often, in the straight lines we can recognise the upright elements of formal staging such as viaducts, sight lines to towers or chimneys and the sometimes rigid lines of poplars.

When in the landscape of the infrastructural networks we can recognise an architectural staging, as in the deliberately picturesque moment of a sudden view or the formal staging of coulisses, we can call this movement space a flowscape. The flowscape is the landscape-architectural staging of the urban machinery in motion; as such, it arranges the urban field in accordance with the mobility scenario of the metropolis. It is in fact an extension of the principle of the route as a basis for a succession of 'scenes', a landscape as perceived

Fig 6: Basic forms: plantation. The urban grid of Los Angeles is determined by the urban programme. Photograph by Saskia de Wit.

Fig 7: Basic forms: theatre. Residential territory edging the Monza park circuit, Milan.

lis and landscape is Reyner Banham's pioneering architectural study of Los Angeles in 1971.[11] The first settlement was founded at the place where the river valley of the Los Angeles River opened up to the Pacific. At first the sandy coastal plain was divided into ranches for cattle rearing with areas of wilderness left as public lands. Soon afterwards however, the colonisation grid for which Thomas Jefferson had laid the foundation in the Land Ordinance Act (1785) - a large-scale framework for agricultural and urban development - was rolled out over the continent. The ranchos were replaced by a network of roads, railways and aqueducts, containing a manifold repetition of the homestead, the detached American house with its surrounding yard. In 1848 the frontier of the New World reached the West Coast and Los Angeles, which at that time had 2,500 inhabitants. It grew into a 'suburb' with 1 million inhabitants by 1915; a 'super-urb' of 17 million inhabitants by 2003.

Banham decomposed this super-urb into four different contextual fabrics, 'ecologies' in his words: mountains, plains, beaches and freeway. There are no urban hierarchies to be found here, as becomes clear from his reading of the ecologies. Although Los Angeles is situated on one of the world's most beautiful beaches, the 'greatest City-on-the-Shore', it is not a seaside city. It was not entered or conquered from the sea, nor has it a very important port. Its genesis lies inland, a foundation that suddenly began to leapfrog towards the sea in the railway age, creating a string of seaside suburbs. And although the original settlement is at the edge of the valley and the hills, and extended rapidly uphill, the main extension remained sensibly on the flattish valley-bottom. This valley-bottom determines the world's image of Los Angeles - an 'endless plain endlessly gridded with endless streets'.[12] Paradoxically, this is also the area where Los Angeles is least distinctly itself, and the image is countered by its images of component parts like Hollywood or Malibu. The fourth ecology, the freeway system, is not just a transportation mode, serving the other ecologies but a single comprehensible place in its own right, dictated by a unified system of freeway signs, and deeply ingrained in the psychology of the Angeleno. The fabrics of Banham's metropolis underline not only a fundamental relationship between urban form and an underlying landscape condition, they also hint at the development of compositional elements - basic forms - constituting a new metropolitan composition.

If the metropolis is a generic condition, then its basic forms should be discernable in some form or other in other metropolitan areas; a landscape 'vivisection' of the European metropolis should yield similar archetypal basic forms as those in Los Angeles. The second example, the Randstad, although researched widely in those terms, is questionable as an example of a metropolis. Politicians, geographers and architects still doubt its mere existence.[13] As an urban agglomeration however, with a loose collection of villages, towns and cities gathered around open polder lands of the Dutch Lowlands and joined by a dense network of infrastructure, it increasingly demonstrates spatial phenomena typical of metropolitan territories. If we want to get a grip on the formal problem of an emerging metropolis that becomes visible here, we should not view this agglomeration in the traditional formal images based on a categorical distinction between 'red' and 'green', nor in a holistic view of landscape and city in a complex interrelation. An elementary investigation of the landscape-urban system is instrumental.[14] The western zone of the Randstad, defined by the conurbation of Utrecht, Nieuwegein and Houten is chosen as a case study area.

Flowscape

The motorway landscapes of the Randstad have long since displayed an 'otherness' in comparison to other urban territories in the Netherlands. A cocktail of stringent environment legislation, market forces and administrative divisions has resulted in

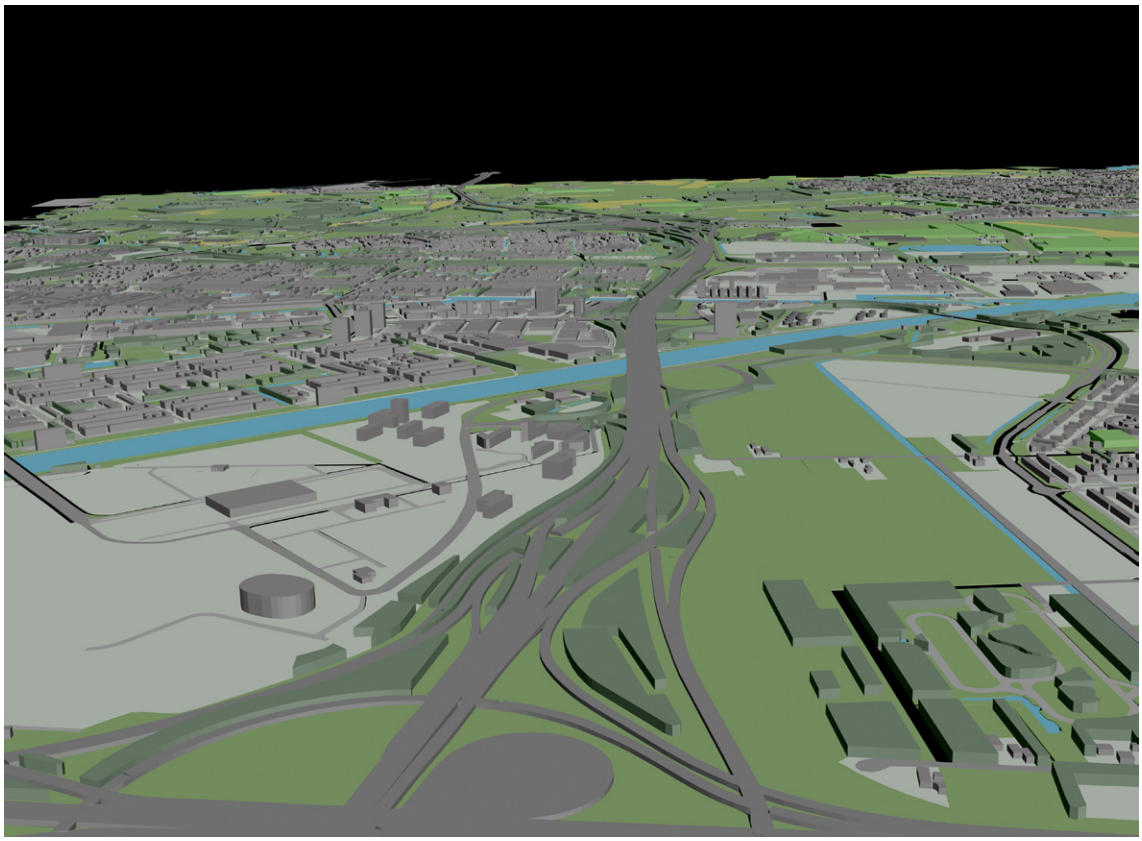


Fig. 8. The motorway landscape of the A12 zone. René van der Velde, ‘Supertype’, in: *A12Nu, Onderzoek naar de A12 zone tussen Utrecht, Nieuwegein en Houten* (Rotterdam: Artgineering, 2009) pp. 46-51. Drawing by Jan Wilbers.

while in movement, as in the 18th-century landscape garden. The locomotion is motorised and *en masse*; just as the 'scenic drive' threaded through the landscape garden, so the motorways of today wind like human rivers though the urban landscape. The grand scenic parkways, built in the 1930s in the United States, recreational motorways interconnecting parks and park areas into a coherent system in such a way that motorists could enjoy nature while in transit, made the translation from the landscape garden into the urban realm. The roads were often designed to respond to the natural contours and cross traffic was carried overhead by rustic bridges, making the act of driving itself pleasurable. Panoramic views were afforded from various look-out points.[16] A similar accent on the narrative aspect of the road can be found in the designs for the expansion plans for Rotterdam (Witteveen, 1928) and Amsterdam (van Eesteren, 1935), and Neutelings took it even further in his study of the Ring road of Antwerp (1988) by describing the road as a functionally and visually autonomous urban space.[17] [fig.9]

Plantation

Beyond the flanks of the A12 lies a constellation of urban concentrations. In the rolling screenplay of the Randstad-motorway 'road trip', these urban concentrations appear as low stripes briefly interrupting the horizon. Using other metropolitan networks, the metropolitan resident passes through these areas, revealing interiors defined by programmatic zones of housing, work areas and recreation facilities. [fig.10] The fabric of these territories is defined by the programmatic demands of each land use: suburban subdivisions, industrial and office park allotments, lakes, forests and parks. These fabrics are essentially thickenings of a surface: a 3-dimensionalisation of a programmatic plan figure.

Existing and future urban programmes are the mechanisms for organising the colonisation of the urban field. These programmes lay down rules for the physical environment that give rise to regular patterns (grids) placed upon the existing natural and cultural landscape, with similar ordering principles for urban programmes like dwelling, work and leisure (as regards plot subdivision, dimensions, form and alignment) and programmes geared to intensive cultivation, such as forestry and glasshouse horticulture. In its basic form this harks back to land reclamation, the colonisation of the cultural landscape and the rational pattern of the 17th-century Dutch town. If the programme of the urban colonisation grid is staged in landscape-architectural terms, and the interaction between grid and the existing natural and cultural landscape is expressed in the design, we can call this second basic form of spatial landscape a *plantation*. The term plantation evokes associations with markets and production, and denotes that the underlying landscape has been technically modified. The basis for spatially organising the urban programme is an imaginary rational grid of squares laid over the existing landscape. The grid module derives from the dimensional characteristics of the urban programme but is carefully balanced against the grid dimensions of the cultural landscape. This landscape gains architectural expression in the interaction of new grid and existing landscape. This in turn gives rise to urban and rural fragments with an active role to perform and enable, together with the plantation, a new compositional equilibrium. Ellen Marcusse's design for Almere-Hout, a district of the Dutch city of Almere, is based on an unpredictable trade-off between a simple urban grid and an invisible landscape layer composed of the many archaeological sites in the plan area, the former bed of the Zuiderzee. Holes are to be scooped out of the urban fabric to receive public gardens at key archaeological sites to enable future excavations here. The locations of these sites is as yet unknown, so that the resulting pattern has a major element of unpredictability built in. [fig. 11]

Theatre

The urban-landscape continuum of the metropo-

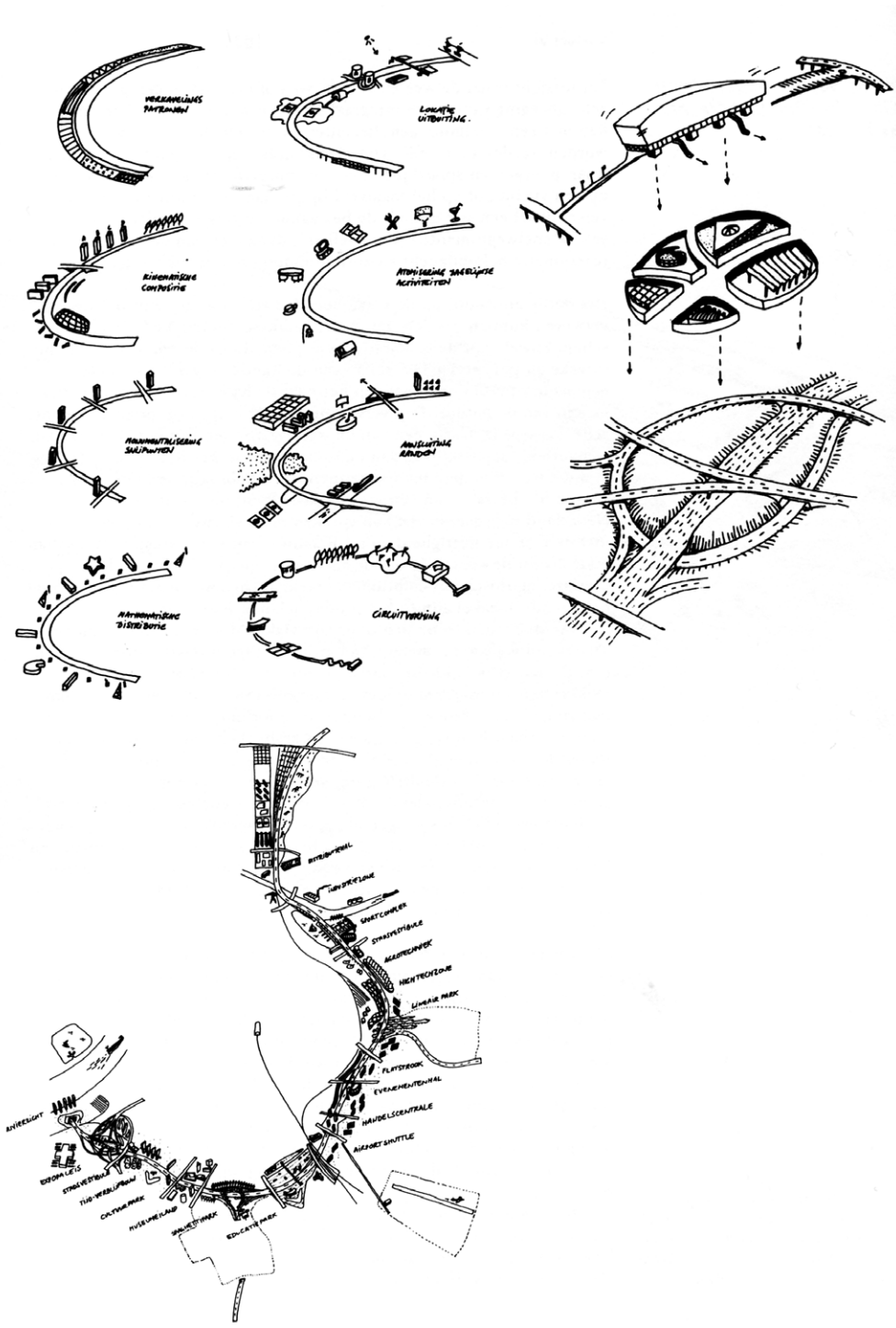


Fig. 9: Flowscape: Project Neutelings W.J., ‘Ringcultuur’. In: *Vlees en Beton,* 10, 1988.

lis puts an end to the 'edge-of-the-city' condition where the (open) landscape is traditionally apprehended. In the metropolitan territory the 'space' of landscape; indefinite, contained or endotic - must be had *within* the bounds of the urban field. Lerup opens his book *Beyond the City* with a description of Houston's urban area as a 'mottled plane … crude and wild, marked by fissures, vacated space, and bits of untouched plain'. He relates Houston to Smithson's analysis of New Jersey 30 years earlier: '(Passaic) seems full of "holes" compared to New York City, which seems tightly packed and solid, and those holes … are the monumental vacancies that define, without trying, the memory traces of an abandoned set of futures.'[18] The edge of the metropolis - as even the largest conurbation does end at some point - can be considered as an edge-of-the-city moment only for those lucky enough to live near it. In the case of the Randstad and Los Angeles the sea forms the most abrupt and definitive edge-of-the-city moment. Within the metropolis, topographic 'lesions' in the metropolitan fabric such as the slag heaps of the Ruhr or Monta Stella in Milan function as surrogates for the edge-of-the-city experience: the viewer temporarily withdraws out of the spatial confines of the city and views that selfsame city as landscape - using the spatial and visual 'devices' of landscape to perceive the city. In the absence of major topographic 'lesions' - as is the case of the Randstad - the apprehension of landscape space is restricted to voids within and between urban tissue. In the A12 zone these voids are the unintentional results of environmental legislation and zoning conflicts. Relief from the congested space of the plantation can be found in the primordial space of these derelict gaps. Swimmers flock to sand depletion lakes; birdwatchers to polder relicts. [fig.12] Spatial quality in the voids along the A12 is at best accidental; the composition of a void necessitates firstly recognition of its existence and then potential. When this occurs we can speak of the existence of a third basic landscape form - the landscape *theatre*.

These open spaces hark back to Smithson's description of the holes in the urban fabric, 'the monumental vacancies that define, without trying, the memory traces of an abandoned set of futures'. The theatre can be seen as the counterpart to the programmatic excess of the plantation, where the city-dweller stands face to face with natural processes, the 'longue durée' of evolution and natural growth, silence and emptiness. Here the horizon of the landscape is inverted towards an inner horizon in the urban domain. This spatial 'staging' of the panorama, the 'scene', refers to the staging in a theatre, a *landscape theatre*. The landscape theatre is conceivable at every scale within the panoramic range. The landscape theatre is used in the definition of metropolitan form in Deltawerken 2.0, the graduation project of Ronald Rietveld for the Amsterdam Academy of Architecture in 2004. To direct the urban growth of Arnhem en Nijmegen a void of 3000 ha has been secured within the small-scale urban landscape for an area between de Rhine and Waal rivers. The design targets a flood bypass proposed by the national water authority to counter the threat of peak discharges from the Rhine and the Waal. This civil engineering intervention comprises an empty bypass, which is expected to fill every 20 years with excess water from the rivers. A 200-meter wide dike planted with 50,000 elms contains the void. [fig. 13]

Returning to Banham's study of Los Angeles - in which the contextual settings are described as atmospheres or psychological realities - we can recognise the basic forms in the metropolitan fabric. The freeway system is not only a way of living, but a *flowscape* with its own form, separate from the urban grid and with a three-dimensionality derived from necessity, providing a sequence of views related to being above the cityscape with panoramic views or being within and being part of it. The city itself has the character of a *plantation* with the diagrammatical structure of a matrix that can absorb and generate an unlimited number of functions and programmes. The urban coastline, over 100 kilometres in length,

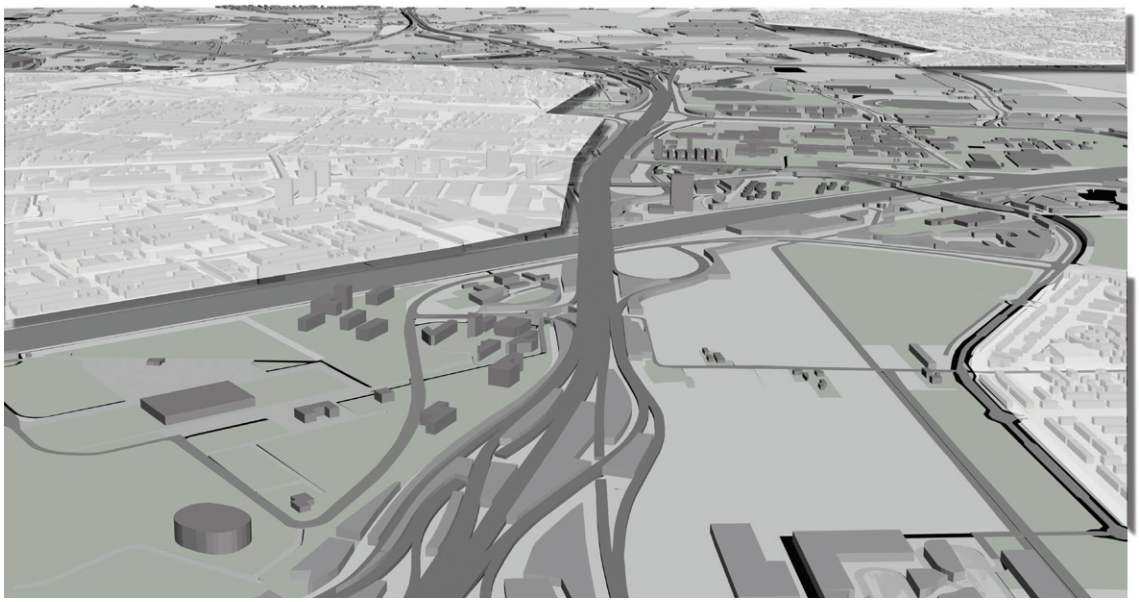


Fig. 10: Urban concentrations along the A12 zone. René van der Velde, ‘Supertype’, in: *A12Nu, Onderzoek naar de A12 zone tussen Utrecht, Nieuwegein en Houten* (Rotterdam: Artgineering, 2009) pp. 46-51. Drawing by Jan Wilbers.

curves inland between two rock formations, where it forms a water stage and a recreational surface of 40 kilometres in diameter. The landscape functions as an open space, a *landscape theatre*, in the metropolis, a new metropolitan form, introducing the natural form and the landscape scale as self-evident components of the city.

Ordering and composing the metropolis

Flowscape, plantation and landscape theatre can be regarded as landscape-architectural basic forms of the metropolis. However, these basic forms, applied as equal components distributed in response to programmatic needs, will still lead to a diffuse, fragmented and disorienting environment. 'Described here as complete and more or less self-contained landscapes, in reality they are impossible to distinguish geographically. In the villa landscape [that developed from the Renaissance onwards], with its intense relationship between villas (plantations), the view across the open landscape (landscape theatre) and the transport arteries formalizing the urban territory (landscape of flows) we can see how an ingenious interplay between the prototypes can breach the scales defining the landscape and endow that landscape with architectural form.'[19] As in the villa landscape, basic forms in the metropolitan landscape need to be embedded in a composition or structure that addresses fragmentation and disorientation, but without relapsing in the hierarchy-based organisation of the traditional city that has proven inadequate for the metropolitan condition.

The potential basis is the landscape: permanent, neutral and ubiquitous. Thus the composition of the metropolis as a landscape-architectonic problem has two levels. The basic forms are derived from the landscape-architectonic treatment of the (urban) landscape, the theory and history of composition, but the way they come together is again based on the physical landscape itself, the geomorphologic constant and unlimited substructure.

Landscape as redeemer of contemporary urban territories is a notion that has preoccupied designers and planners for the last two decades. Its attraction to planners and designers is understandable, not in the least because devices to comprehend and drive contemporary urban environments are becoming scarcer. The composition of new urban territories is increasingly reduced to the organisation of surfaces and infrastructures, by-and-large replacing the architectonic repertoire of city design of compact urban environments. In the urbanism discourse, landscape has moved beyond its traditional meaning as pastoral scenery or garden planting and now engages spatial problematique in urban territories under the umbrella of Landscape Urbanism.[20] In its 'coming-of-age' landscape is less a quantifiable object than a way of seeing and doing. Landscape Urbanism repositions landscape in a broader sense as a large-scale organisational tool and thus relevant to the contemporary city. It cites the subject and practice of landscape above and beyond what is conventionally considered as landscape: the 'antithesis' or respite from the urban condition, contained within it but not a part of it. Landscape is championed as a device to regain meaning in this new reality: in the flat, extended non-city, landscape is the last relevant 'ground' for development. Landscape Urbanism sees surface as a defining tool in the choreography of the city. Surface here is understood as more than a formal or aesthetic working of the ground: the surface is seen as an agent of urbanisation. This means that the ground is prepared with the specific intention of organising future urban programmes or of being completely appropriated by them. Moreover, landscape is increasingly employed to comprehend and order urban development, because they have come to resemble each other: the city now changes, transforms and evolves as a landscape. Landscape can be instrumental as a tool in thinking about territories, in understanding larger spatial phenomena invisible to the eye of architecture and urbanism. Landscape Urbanism positions landscape as an

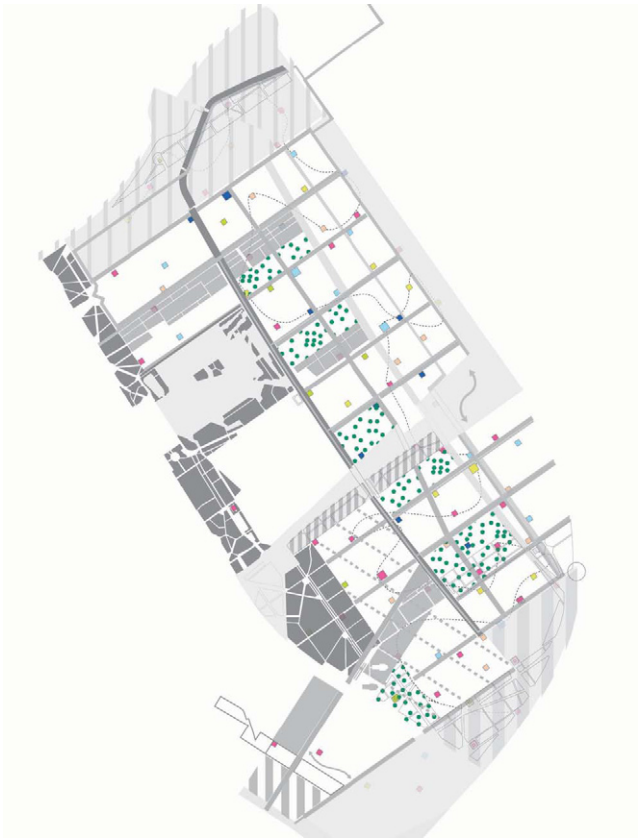
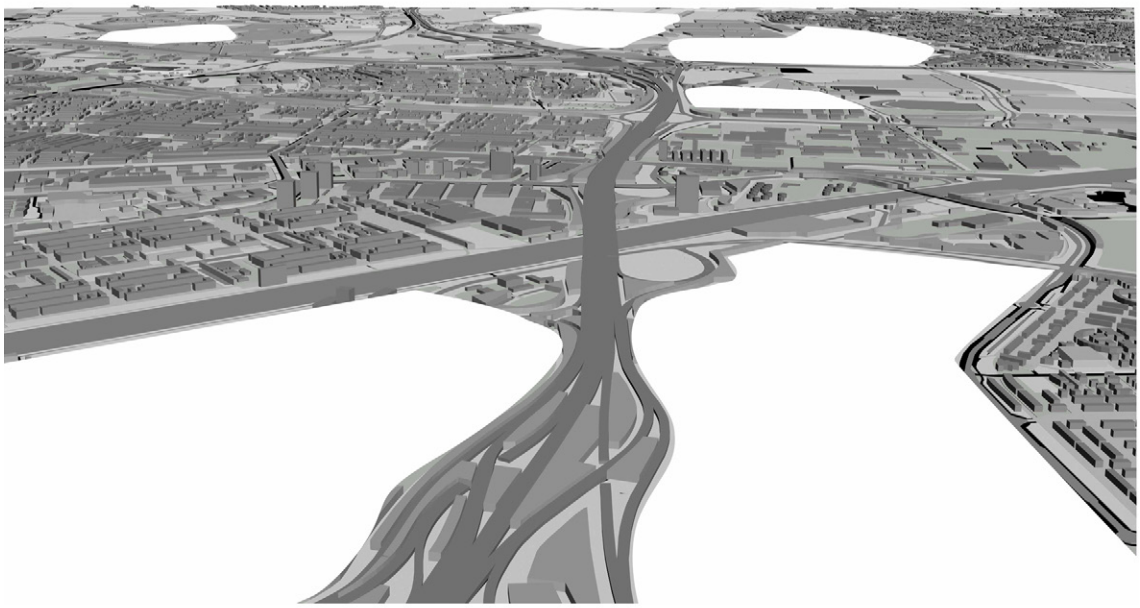


Fig. 11: Plantation: plan for the new suburb Almere-Hout, where the interaction between urban grid and the underlying archaeological landscape is expressed in a constellation of public gardens. Design by Ellen Marcusse, (uitgave Vereniging Nederlandse Gemeenten) 1999.

infrastructural device - a medium through which all things must pass.

As shown above, this notion of landscape as an organisational tool for the composition of the metropolitan territory itself is not new. It has been part of the urban design history throughout the evolution of the metropolis, but it should be redefined in the light of the new task at hand. What compositional tools has the landscape to offer? If continuity and hierarchy can be said to be replaced by contiguity, then, as Steenbergen, Reh and de Zeeuw posed in their theory about the urban transformation processes, 'the montage concept seems appropriate to connect the fragments of the urban landscape in a meaningful manner [...] since it no longer aims at a harmonious connection of disparate parts, but can stage completely opposite or even contradictory urban programmatic parts landscape-architecturally, by means of stacking and confrontation. In the montage the architectonically active parts of the existing landscape are as it were, prepared and inserted in a new composition at a different scale.'[21] But how can we see this so-called montage in a physical, visual and spatial sense? The landscape as an informant of this metropolitan composition provides several motives leading to different models. A first motive is the structure of the existing landscape, built up through the ages from the geomorphogenetic system of mountains, rivers and oceans, formed by the forces of nature, of land, water and wind, and transformed by the processes of cultivation and of civil engineering.[22] This motive would lead to the geometric model of the landscape as substructure or framework. A second motive is the landscape space, often - especially in a dense country like the Netherlands - used in a conservative manner, to 'preserve the open landscape', but with a potential to serve as a spatial model, dictating the position of the landscape theatre as opposed to the plantation. The conceptual discourse on the relationship between the metropolis, the city and nature can be seen as a third motive for the staging of a landscape-urban composition. While the notion of city is inherently directed towards artifice and the absence of natural forms and processes, the metropolis on the other hand points in the opposite direction, towards an *innate* and non-hierarchical relationship between artifice and nature.[23] This is the basis for the third model, where the landscape takes a narrative position: the landscape as specific place or territory, a provider of meaning, grounding the generic system of the metropolis.

If we look again at Banham's study of Los Angeles we can recognise not only the basic forms in the metropolitan fabric, but the contours of the landscape models that determine the composition of metropolitan landscape. The continuous urban field of some 10,000 square kilometres also encompasses the hills situated in the plain like a gigantic tribune. Seen from here, the city is reduced to a geographical texture, with the ocean as a hazy backdrop. The urban footprint appears as a city that is, at the same time, a landscape; a metropolitan landscape. The distinct topography of coast, hills and central flatlands is the *carrier of the metropolitan structure*, the transformation of the generic Jefferson grid into a unique city. In principle this metropolitan landscape encompasses the entire space; it is generic and unlimited until it encounters an insurmountable physical geographical barrier such as the ocean. Here the supergrid collides with primal nature, with Sunset Boulevard as a new active scenography of this confrontation. The spatial qualities and the scale of the landscape have been introduced as a *landscape space* within the metropolis, the space of the ocean, enhanced by the way it is overlooked by the different levels of hills, plain and boulevard. Thirdly, in the well-known images of the beautiful white sandy beach, the endless plain with its supergrid and the delectable mountains of Hollywood, Beverly Hills, Bel Air and the like we can detect the landscape as an *indicator of place*, complementary to the generic character of the metropolis, taking up a narrative position, a giver of meaning.[fig. 14]



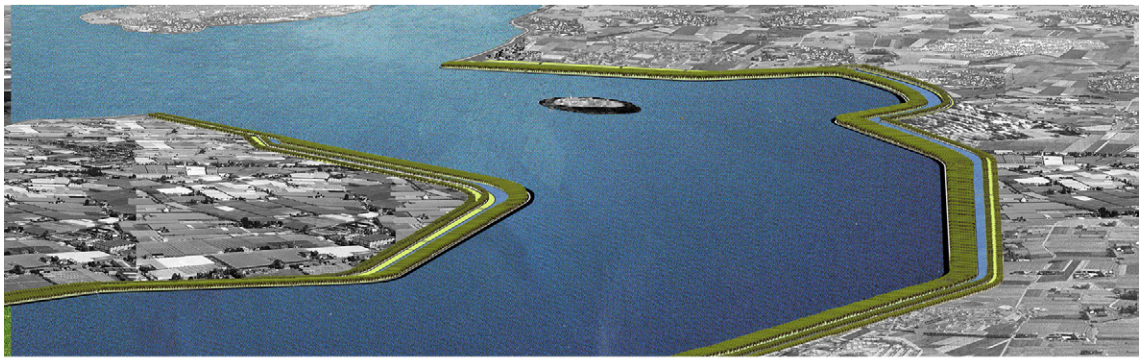


Fig. 12: Landscape voids along the A12 zone. René van der Velde, 'Supertype', in: *A12Nu, Onderzoek naar de A12 zone tussen Utrecht, Nieuwegein en Houten* (Rotterdam: Artgineering, 2009), pp. 46-51. Drawing by Jan Wilbers.
Fig. 13: Landscape theatre: Deltawerken 2.0, plan for a river bypass functioning as a theatrical void, the core of the proposed double-city Arnhem-Nijmegen. Design Ronald Rietveld, graduation project Academie van Bouwkunst 2004.

Narrative places can be nodes in the metropolitan galaxy, defined places in a continuous field, not expressing the spatial-temporal continuum of the metropolis, but discontinuities in it, anchor points to the landscape topography that connect the generic network of the metropolis to the *genius loci*. Narrative places can be viewed as rhetorical landscapes; they are made of the same materials as all the rest, just as the rhetorician's words are those given by the language, but composed to 'instruct, move and delight' (Cicero's definition of the rhetorician's duties). With some affinities to metaphor in literature, they are places where the relationship of things is so moving or so clear that the rest of the world is illuminated for us. These places evoke their origins, are an expression of the *genius loci*. The term 'genius loci' is derived from the Romans who read places like faces, as outward revelations of living inner spirit. Each place had its own individual Genius - which might manifest itself, on occasion, as a snake.[24] Such spaces are indissolubly bound to the (urban) tissue, and at the same time they are essentially 'other spaces', contrary to their surroundings, 'in such a way as to suspect, neutralize, or invent the set of relations that they happen to designate, mirror or reflect.'[25]

The play between the city and the landscape is resulting in metropolitan compositions at very different levels and the interaction with the landscape generates spatial forms on very different scales. Where the case of Los Angeles exemplifies the way the three models can co-operate to construct a metropolitan composition of plantation, landscape theatre and flowscape on the scale of the metropolitan region, we would like to compare this with an example of a metropolitan transformation on an much smaller scale: the transformation of Hampstead Heath from common ground to Metropolitan Park. Already in the Middle Ages London became a 'scattered city', a city outside its perimeter, existing of several townships. In the early 19th century John Nash made his 'Grand Design', as an expansion plan for London, meant as the completion of the 'metropolis', the rehabilitation of the visual contact with the surrounding landscape and an attempt to make space for the modernising of urban public life. The 'Theatrical Panorama', with Regent's Park as the core, was used as a major design tool.[26] Parallel to this Grand Design, the layout of London has gathered, more or less consciously, around similar landscape cores: royal hunting parks or common grounds, carriers of the metropolitan structure.

One of these cores is Hampstead Heath, with its openness to the natural elements and to the sky, whose moods the land merely reflects, a prototypical landscape theatre. The enormous impact Hampstead Heath has on writers, poets, painters and philosophers is an indicator of its quality as a metaphorical landscape, a place with a strong narrative impact. Since the Middle Ages the heath was used as common land, for grazing, gathering and digging. Over time the accent in appreciation shifted from its natural resources via its military value as a commanding height near London and manoeuvring site, its value for health and outlook, and finally for its own scenery and the possibilities it offered to escape from noise and dirt to one of the few remaining 'lungs of the metropolis'. This resulted in 1871 in the Hampstead Heath Act, authorising the Metropolitan Board of Works' purchase of nearly all that survived from the original common.[27]

On the edge of the heath lies Hampstead Heath Garden Suburb. This suburb, designed by Raymond Unwin and Barry Parker at the beginning of the 20th century, was one of the first green suburbs and has been of great influence on the development of suburban housing. Suburbs like these are ultimately metropolitan in the sense that 'each family home becomes the central point for its members. They create their own "cities" out of the destinations they can reach (usually travelling by car) in a reasonable length of time.'[28] The pattern formed by these destinations represents the city for that particular family

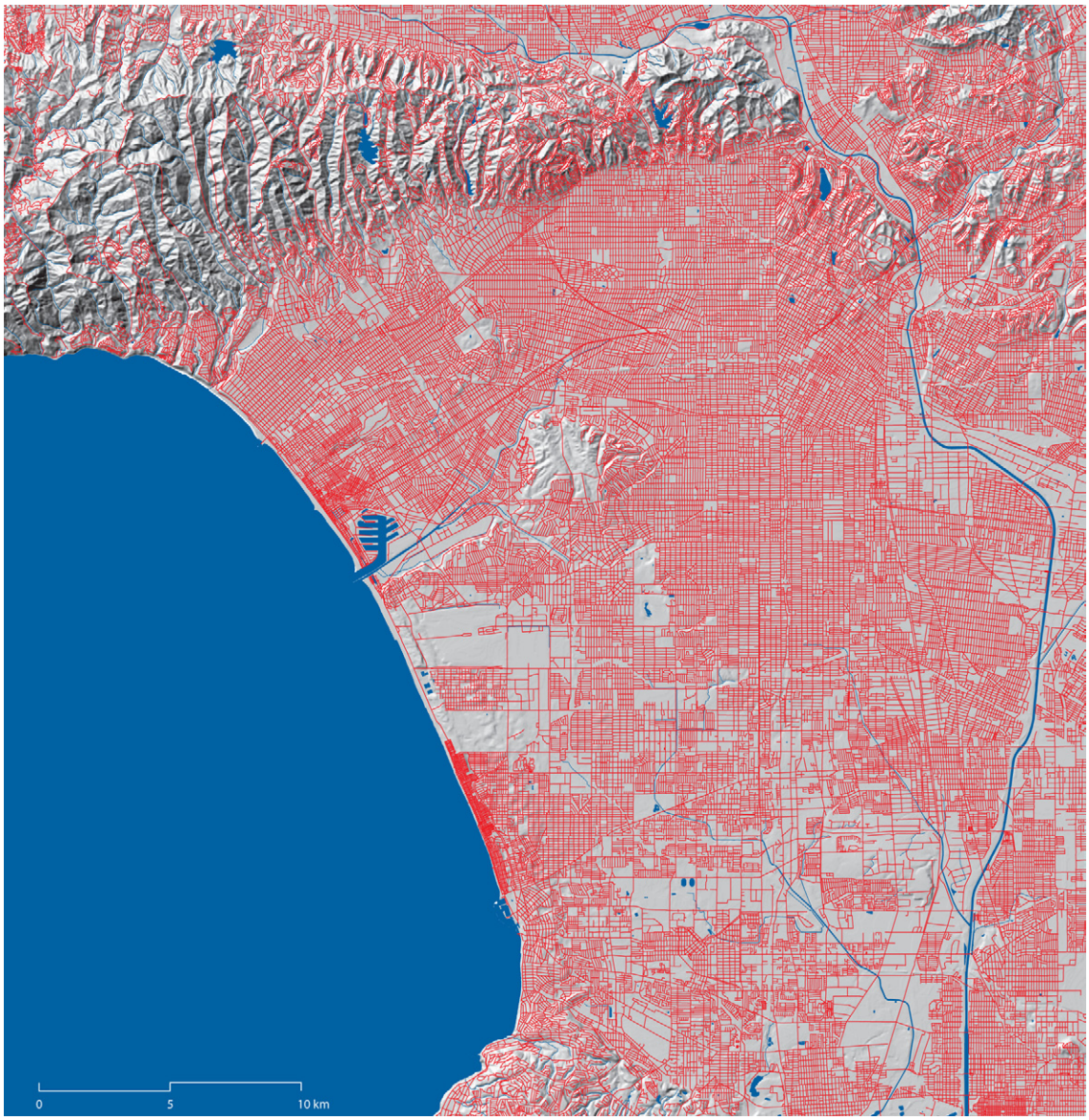


Fig. 14: Choreography: the collision of supergrid and primal topography in the Los Angeles metropolitan structure is made expressive in the landscape forms of the flowscape, plantation and landscape theatre. Drawing Michiel Pouderoyen/Clemens Steenbergen.

or individual, a city based on time rather than space or distance, where each destination is measured in minutes instead of miles. On the other hand Hampstead Heath Garden Suburb is firmly anchored in landscape space. The different layers of landscape-architectural intervention, as seen in the position of the heath in the urban tissue of London, are in a condensed way expressed in the boundary between heath and the suburb. The boundary is both the condition to create an autonomous space, an 'other' space, as the connection to the outside, a reflection of the world on the other side. Hampstead Heath Garden Suburb exemplifies the definition of the boundary as an expression of the relationship between landscape theatre and plantation. In the oldest part of the suburb the homes are separated from the heath by a wall. Garden pavilions and sheds are embedded in the wall like medieval watchtowers. Only where one of the main streets of the neighbourhood emerges on the heath, the wall opens up to give pedestrians access to the heath. Southwest of the Great Wall are the first extensions of the quarter, and here an opposite approach is chosen. The homes are grouped around closes that open up directly to the open space of the heath. Height differences and low walls articulate the closes clearly as independent collective spaces pulling the landscape space of the heath into the suburb.[29] [fig. 15]

Choreography

The case of Hampstead Heath illustrates the development of unique and specific topologies made possible by the 'drawing-near' of the metropolis to nature. The enlargement and distortion of specific topographies result in a field of new topologies, drawn from the *genius loci* and from local cultures and customs. The lack of hierarchy, not only in artifice and nature, but also in a spatial sense, implies that meaning is no longer derived from the structure or centre as in classical urbanism, but is borrowed from the characteristics of place. Judgements on the lack of compositional quality - *contiguity* - in metropolitan territories are also determined by the same classical urbanism sensibilities. When the city disintegrates into an archipelago of fragments a new role is imposed on the landscape as a carrier of topographical characterisations, cohesion and continuity. In the metropolitan territory the role of the landscape is of equal importance, regardless of programmatic, spatial or geographical differences. In the traditional dialectic landscape-city the countryside is omnipresent, and concurrent with landscape; the only design problem is safeguarding it from the land-hungry city. In the city on the other hand, other mechanisms (the urban programme) determine form. Landscape does play a role as an underlying structure and physical determinant, but is not a spatial and visual reality. Spatially, visually and rhetorically the city is considered a counterpart, an opposite of the landscape. In the metropolis other mechanisms may be dominant (networks), but they are so generic and abstract that they do not have the means to generate physical environments. The landscape has the capacity to inform the transformation of the physical metropolitan territory without contradicting the functioning of metropolitan mechanisms. The question is not so much *if* metropolitan form is determined by landscape, but *how* we can use it to structure and give meaning to territories: a delicate choreography of mega-shapes and the micro-topography of landscape places.

Notes

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2. Dirk Frieling, 'Inleiding, opzet/methode ' in: *Onderzoeksatelier Deltametropool: Strategische Rol van het Ontwerpen* (Delft: Delft University Press, 2001), p. 8.
3. Kevin Lynch, *A Theory of Good City Form* (Cambridge, Mass./ London, 1973), pp. 73-98.
4. Clemens Steenbergen, 'Metropolitan Footprints', in: *The Architecture Annual 2006-2007* ed. by H. Bekkering et. al. (Rotterdam: 010 Publishers, 2008), p. 110.

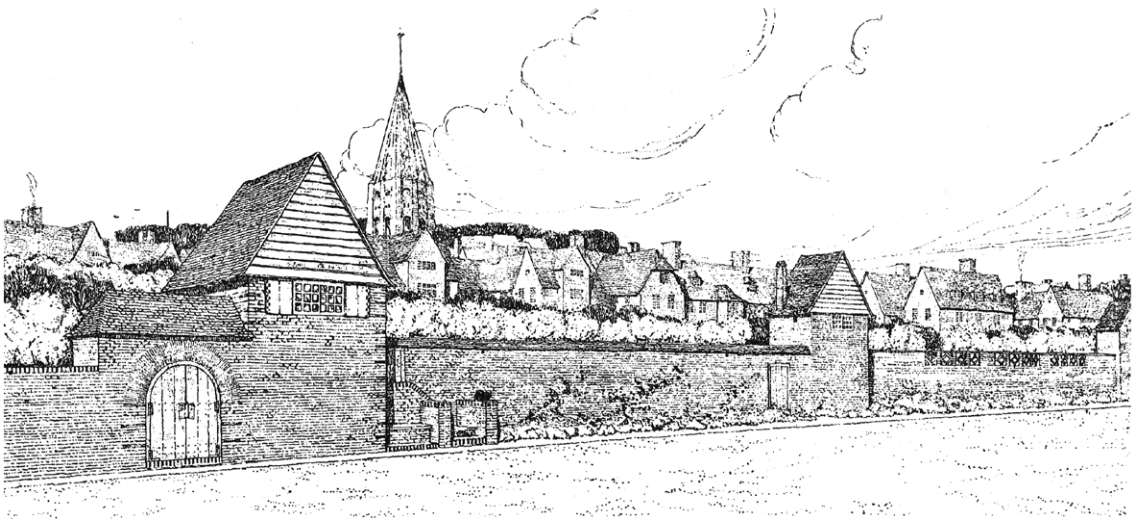

Fig. 15: Choreography: the boundary of Hampstead Heath Garden Suburb as a condensed expression of the geometrical, spatial and narrative position of the heath in the metropolis: the Great Wall (R. Unwin and B. Parker, 1909) and Waterlow Court. Design M.H. Baillie Scott, 1909.

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7. Rem Koolhaas and Bruce Mau, 'Congestion Without Matter' in: *S, M, L, XL* (Rotterdam: 010 Publishers, 1995), pp. 895-943.
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15. René van der Velde, 'Supertype', in: *A12 Nu: Onderzoek naar de A12 zone tussen Utrecht, Nieuwegein en Houten* (Rotterdam: Artgineering, 2009), pp. 46-51.
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19. Saskia de Wit, 'Layered Lowlands', in: *The Architecture Annual 2003-2004*, ed. by D. Hauptmann and H. Wanders (Rotterdam: 010 Publishers, 2005), p. 116.
20. Landscape Urbanism is a term coined by Charles Waldheim. Charles Waldheim, *The Landscape Urbanism Reader* (New York: Princeton Architectural Press, 2006).
21. 'Het montageconcept lijkt geschikt om de fragmenten van het stadslandschap zinvol met elkaar te verbinden [...] omdat het niet langer streeft naar een harmonische verbinding van ongelijksoortige onderdelen, maar volstrekt tegengestelde of zelfs tegenstrijdige stedelijke programma-onderdelen landschapsarchitectonisch door middel van opeenstapeling en confrontatie kan ensceneren. In de montage worden de architectonisch werkzame delen van het bestaande landschap als het ware uitgeprepareerd en ingezet in een nieuwe compositie op een andere schaal.' Clemens Steenbergen, Wouter Reh, Peter de Zeeuw, *Landschapstransformaties* (Delft: Delft University Press, 1995), p. 74.
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Biographies

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Movement Technologies, Scale Structure and Metropolitan Life - an Empirical Research on the Effects of the Transportation System on the Metropolitan Process in Beijing

Qiang Sheng and Linfei Han

1. Introduction: walls and pathways, 'setting boundaries' and 'making connections' as two strategies to regulate movement

We live in a world dominated by cities. Although not every corner has been urbanised, our way of life has been totally changed by this fast-extending and infinitely connected urban field. Metropolitan, as the origin of this word indicates, means 'mother city' in Greek. It stands out from other cities for its size and strong economical and cultural influence on the region, nation or the whole world. Instead of emphasising how a certain city or agglomeration of cities achieved this dominant position through politics, governance or economical development, this paper will try to look at how a metropolis, Beijing in this case, has come into being based on the development of modern transportation systems, which both support its functioning and give it a recognisable form.

'Cheng Shi', the Chinese word for 'city', has two characters: 'Cheng' means 'wall' and 'Shi' means 'market'.[1] The first character emphasises the role of the wall as a technical object which gives the city a distinctive 'form'; the second character reveals the functional content of city as a place for meeting and trading. This paper starts with a comparison between 'setting boundaries' and 'making connections' as two traditional approaches of regulating movement in and out of the city. The former, as an exclusive technology of claiming territories, reflects a spatial politics of segregation, while the latter, as an inclusive technology, brings different groups together, stimulates exchange and transgresses boundaries.

Regardless of the fact that they seem to contradict each other as 'wall' verses 'path', practically these two approaches also work in alliance. For instance, in the Qin dynasty (209 B.C), emperor Qin Shi Huang re-built the Great Wall by linking the separate old walls of different kingdoms into one continuous defensive system to cope with the threat from the north. But what is normally neglected is the fact that he also built the new so-called 'Chi dao' (literally 'road for fast running horse') system which functioned as a national road network. Some of them were even made as 700km straight lines to move troops faster to the northern border. Considering the fact that the Great Wall itself was also used for transmitting signals of barbarian invasion rather than as a passive defensive structure, we can clearly see how they together functioned as one system holding the Qin Empire together as a perceivable and functional entity. Therefore, walls (together with gates) are as much movement-regulation technologies as today's trains, metros or highways.

Based on a line of thinking about the importance of movement-regulation technologies for making cities perceivable and functional objects, this paper tries to deal with two interrelated questions regarding Beijing's metropolitan form: Firstly, how have different transportation systems such as trains, buses, metros and highways influenced the formation of the metropolitan area in the last decades? Secondly,

how have changing transportation systems affected the emergence and morphology of central shopping and wholesale market places?

To address the first question, we will present the evolution or modernisation process of Beijing's movement technologies. By 'movement technology' we mean all the technical systems affecting people's movements rather than purely transportation technologies such as trains, buses or metros. This obviously includes the physical condition of the roads, such as width and paving, but it also includes non-physical organisational techniques, like the naming system that may reveal the scale hierarchies of streets. From this evolution process we can see how the old approach of using walls and gates to regulate the movement has been replaced by more complex modern transportation systems, and how certain transportation systems have contributed to the development of the historical city into a modern metropolis.

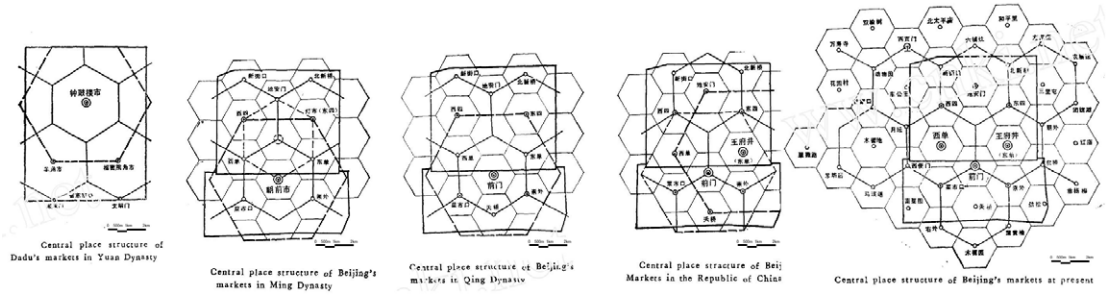
For the second question, we will present the morphology of metropolitan centralities in Beijing based on the data of shopping areas and wholesale markets in 1924, 1987 and 2006. The data will be analysed by spatial models constructed on the basis of the scales of movement networks presented in the previous part. From this study we may find how the logic of 'making connections' can affect the emergence of centralities, in place of a bounding in by walls and gates as in the past. Further, this analysis and model will be compared with the Central Place model used by Gao[2] to analyse the morphologies of Beijing's shopping centres.

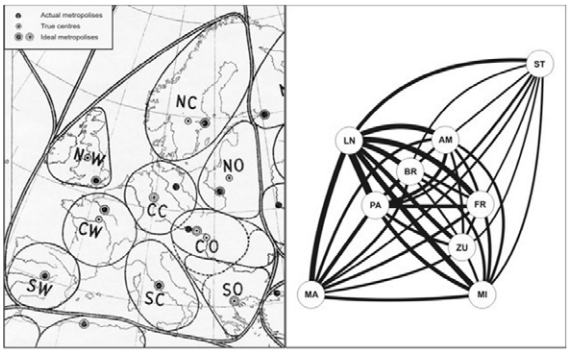
2. Theoretical background: from Central Place as a hierarchical model to Central Flow as a network model

Central Place Theory was developed by the German geographer Walter Christaller[3] based on his empirical research on the population, spacing and hierarchy of settlements in south Germany. In the 1960s, the American G. William Skinner[4] analysed the rural market system in late 19th-century China. His results, especially the division of China into eight 'macro-regions' based on economical relationships, are considered path-making by many Chinese historians and urbanism researchers[5]. On the issue of retail geography and shopping behaviour, Berry and Garrison's research on Snohomish County[6] provided empirical evidence for the existence of hierarchies of central functions. Among Chinese scholars, Gao, using the Central Place model, analysed the morphology of Beijing's shopping centres from the Yuan dynasty to the 1980s. [see fig.1] His work has been widely quoted in the Chinese academic world.

In the latter part of this paper we will refer to some of his work in detail. For now we will briefly outline some problems in his analysis. Firstly, his model didn't fit very well with reality, especially in 1980s, and he didn't present the actual distribution of shops in the 1980s and Minguo periods (1911-1949), using only the names of places as an indication. Secondly, his research used cultural and social demographic changes to explain why certain high level centres gave up their positions to others. This, strictly speaking, is not a problem, since the morphology of centralities is a complex phenomenon and should not be simplified to just their spatial aspects. But, it also reveals a limitation of the Central Place model, which is by its nature a static model presenting an 'equilibrium state' of the system. It does not readily capture the dynamics of change. Last but not least, Gao's way of using the Central Place model didn't reflect the development of transportation technologies, and the service range of central places remained the same in all periods.

In fact, Skinner had already emphasised the importance of transportation systems. He argued that the development of modern transportation technologies could eventually eliminate regular markets in villages, while intensifying the use of intermedi-





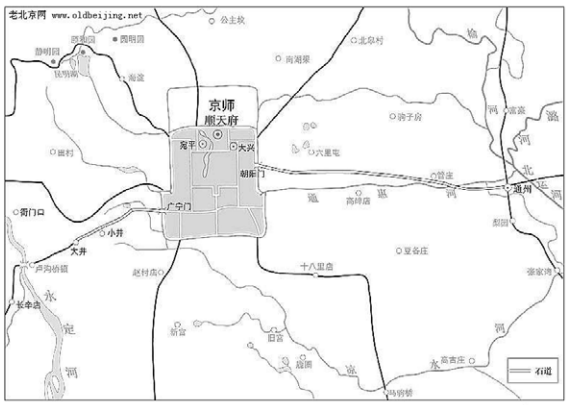


Fig. 1: Central Place model of Beijing's shopping centre in Yuan, Ming, Qing, Minguo and People's Republic of China (from left to right). Source: Gao, S., 'On the Historical Changes of Markets and their Location in Beijing', in ACTA Geographic SINICA, 44 (1989).

Fig. 2: Comparison between Central Place model (left: Subdivision codes: CC Central-Central, CO Central-East, CW Central-West, NC North-Central, NO North-East, NW North-West, SC South-Central, SO South-East, SW South-West) and Central Flow model in Europe (right: Inter-city links between nine European cities as practised by advanced producer services). Source: GaWC Research Bulletin, p. 261.

Fig. 3: Different pavements of old Beijing region (Ming/Qing Dynasty) Source: http://www.obj.org.cn/Photo/class01/Class7/1275.shtml (accessed 24 Feb 2009).

ate markets in larger towns or cities. Similarly, in examining how metropolitanisation processes influenced the hierarchy of central places in western Snohomish County, Berry had also emphasised the role played by freeway networks on increasing the motility of customers.[7] As a result, the new metropolis could cause a shift of central functions between centres in different positions in the hierarchy, as well as a change in population-function relations in the region. Berry argued that numbers of central functions were the proper indicator for ranking rather than the populations of central places.

What is clear for now is that the development of the transportation network is of great importance for the distribution of central places. This paper is not based therefore on Central Place Theory, the well-defined hierarchical structure of which makes it difficult to capture the complex external relationships of cities and regions to their hinterlands. For example, Skinner still used his structure of eight macro-regions when analysing the contemporary situation. His ranking system was built up of many social-economical indicators. But looking at how modern wholesale food markets operate, we can easily see that many goods are imported from outside the system at the scale of the nation at large or worldwide. When we look at the customer range at the city scale, there is a wide variety of ways in which the area is used and the types of goods being sold.

Berry's identification of hierarchy was based on statistical data on numbers and types of central functions. Again, in his analysis he considered complimentary functions as internal relationships within the metropolitan area. Including a higher scale is normally the way the Central Place model deals with external functional relationships, but even then, as a spatial model, it turns out to be too simplistic and rough. Essentially, what Central Place theory is missing is a network understanding of urban dynamics. It is based too much on the paradigm of 'hierarchy' and very difficult to use to capture the complex external relationship of cities. As Taylor points out, the Central Place model still maintains its validity in certain situations: we can easily see that the spatial logic of Central Place theory based on travel distance is relevant for consumer behaviour in most contemporary shopping malls.[8] But this simple internal relationship between centre and periphery, city and hinterland, is part of a process he called 'town-ness'; he proposed 'Central Flow theory' as a complementary theory to grasp the complex external relationships between cities, which he called 'city-ness'. The Central Flow model focuses on the space of 'flow' rather than 'place' itself. [fig.2]

Neal[9] has also claimed that there is a historical move from the logic of Central Place to Central Flow. 'The spatial hierarchy had a greater influence on cities' economic structures at the beginning of the twentieth century, but was gradually replaced by the relational hierarchy, which had a greater influence at the end of the twentieth century.' Following this line of thinking, the opposition between hierarchy of central places (as presented in fig. 2 left side) and inter-connected networks (as presented in fig. 2 right side) are in perfect symmetry with the opposition between 'setting boundaries' and 'making connections' we mentioned at the beginning of this paper: the latter could be considered as a spatial representation of the former paradigm. Of course, this link means more than merely a representation: despite many interesting researches on flight traffic and business connections following the concept of Central Flow theory or the paradigm of network in general (and, like those involving Central Place theory, these researches are mostly on the regional scale), one question still remains for us: what is the role of urban space? If Central Place Theory still remains valid at the lower scale, as Neal and Taylor believe, and if the development of modern transportation networks in the last decades has made distance less relevant for long-distance trade, what is the spatial logic for the distribution of centralities

at the metropolitan scale (between regional and local) today? We believe that the development of the transportation network, the urban infrastructure, is the key to answering these questions. And in this paper we will choose the metropolitan as the scale for our analysis. At this scale we can see how the metropolis is constructed in relation to other metropolises globally and how it is regionally integrated with the local everyday life; how flows of people, material and information (in 'relational hierarchies') are substantiated, and how the hierarchies of different centres are facilitated.

3. Movement networks as construction of scales: Evolution of different transportation technologies in Beijing

In this part we start by analysing different types of movement controlling technologies, from walls and gates, street widths, pavings and names, to train, tram, bus and metro systems. After all, the term 'metropolis' itself doesn't have a clear-cut definition. If we consider only the population, even Bianliang, in the Song dynasty (960-1279 A.D), already had over a million inhabitants. In the case of Beijing, 'Dadushi', which means 'metropolis', is much younger than the term for 'city' or 'suburb'. When focusing on the development of movement controlling technologies, we can start thinking of the role played by these technical objects and the urbanism zoning concepts like 'city', 'suburb' or 'metropolis'. Without the presence of a city wall, how could we define the area of the historical city? Without the presence of 'Chidao' and the Great wall, was Qin still one unified empire? In the modern situation, how have technical objects like trains strengthened the identity of nation states? Isn't the airport constantly reminding us that we live in an age of globalisation? Obviously, those movement controlling technologies have more impact than merely on semantics; what I want to emphasise here is that they have helped us, as language also has, to organise the contingent real world into the 'scales' of neighbourhood, district, city, region and global. Of course, Central Place theorists like Berry and Garrison focused on other attributes, like populations and functions, but these could also be considered emergent products of movement networks. At least the Central Place model itself doesn't indicate any linear causality from central functions to the spacing between these centres. The alternative approach we offer is to question how scalar concepts in urbanism are constituted by the development of transportation networks. We will therefore consider these technical systems at the scales at which they were operating, and then compare the evolution of both technologies and scale structures through 1934, 1968, 1987, and 2006. Subsequently, based on the groupings of movement technologies at different scales, we construct a movement network model to be used in the later part of the research to analyse their relations with central functions of corresponding scales.

3.1 Paving and naming, differentiation of movement networks in old Beijing on regional and city scales

The map [see fig.3] shows the road system in old Beijing (estimated in the Qing dynasty) in terms of different types of pavings: a double line stands for a stone paved road; a single black line is a tamped soil road. Two things need to be noted: first, the most important route and other routes connecting Beijing with other cities or villages have been paved differently. Tongzhou to the east is the most important transportation node for Beijing in that period. Most goods were transported firstly to Tongzhou by canal, then to Beijing by land. Before the automobile and train, our ancestors made distinctions between different transportation networks by means of the technologies available at the time. Second, most main roads inside Beijing were paved with stone. In this sense, stone paving, like city walls, helped distinguish city from rural areas; walls and paths worked together to mark social distinction. This also suggests that new technologies were implemented in the dominant spaces of the time, and then became

available for lower scales and classes.

At the city scale, Beijing's urban fabric reveals a clear hierarchical logic indicated in the names of streets (Dajie, Jie, Xiaojie/xiang, Hutong/tiao and alley) and their widths.[10] In the next part we will show how this spatial logic is represented in pavings and widths and then compare these patterns.

In the map above [see fig.4] Beijing's spatial structure is represented based on the street names. 'Dajie' (big streets) mark out, for the most part, the main road structure of Beijing, connecting with gates to the outside, and gates between the inner and outer cities. Sometimes these names were changed according to their function: in some parts of the west-east oriented main road, 'Caishikou' (or vegetable market - 1 on map), 'zhushikou' (or jewellery market - 2 and 3), 'Suanshikou' (or garlic market - 4) and 'Ganlanshi' (or olive market - 5) were named according to the main goods being sold on that street. In these situations, we draw them as thick grey lines. There are some 'Dajie' located inside neighbourhoods (marked 8, 12, 10 and 9 for instance), whose importance has been 'exaggerated' because they were previously locations of important government institutions.

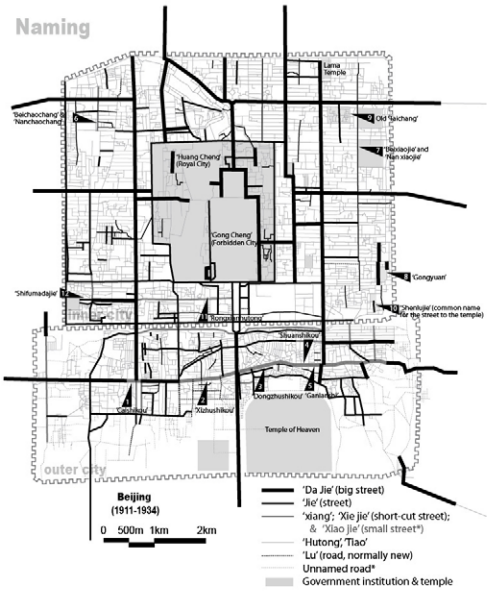
Based on Minguo's map made in 1934, we sorted streets by width and paving [see fig.5]. The structure of movement seems even clearer. Especially the main road network was mostly wide and well-paved. Despite the 'lip service' paid to naming and shown in the previous map, some anomalies appear when people build things up as real physical form. This one also shows some anomalies: 1, some 'Hutongs' were also well-paved and wide due to the important functions or institutions they accommodated: the embassy area (marked 3) for example; and 'Bei/nan he yan', an old canal (marked 6). 2, in some cases the name of a street actually reflected better how it was being used. For instance, 'Bei/nan xiao jie' (marked 5) is not highlighted at all on the map showing paving, yet it actually functioned as a well-used street with quite a high number of shops and activities. In this case what it was called reflected reality better than how it was constructed.

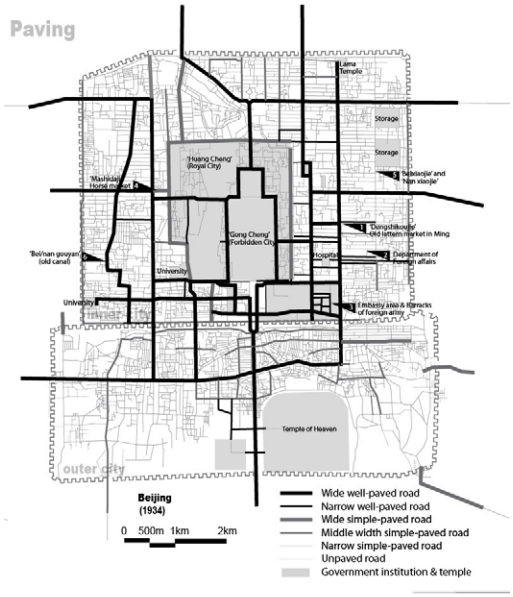
3.2 Development of the railway in the process of modernisation, an indicator of national and regional networks

The first railway built by the Chinese was Jing-Zhang railway, connecting Beijing to the northwest in 1909. However, on the map made by the Japanese in the 1920s, this first railway was not represented, probably because it was a test line. On this map, one part of this first operational rail network connected Tongzhou in the east, and the other went to the southwest. This layout matches the directional axes indicated by stone paving very well.

After the Communist party seized power in 1949, the economy began to shift from being agriculture-based to industry-based. During that period, the northeast part of China became more and more important for its oil field and proximity to the Soviet Union, which provided technical support. From the map of the 1960s, we can clearly see how new railways were constructed to strengthen the connection to the northeast and northwest. [see fig.6] In the 1980s, the northeast connection was further strengthened by adding new lines. In addition, the railway started to form a more complex network to facilitate the needs of industries and passengers in the region. However, in 2006, we can see two tendencies: on one hand, new railways are still being constructed, such as the rapid connection to Guangzhou and Hong Kong; on the other hand, with the expansion of Beijing city and the shift of its economy to being more service-based than industry-based, the former railway on the fringe of the city which served industry now began to be substituted by light rail.

3.3 Evolution of tram and bus networks as indicators of city-movement networks





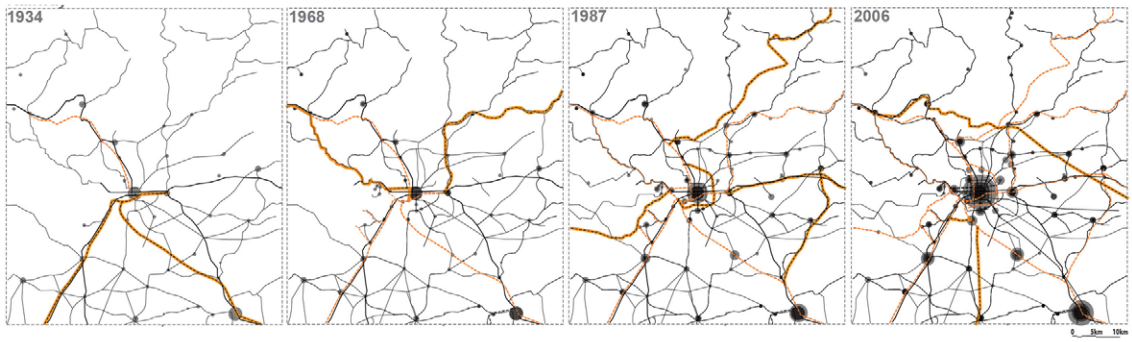


Fig. 4: Street typologies based on names in old Beijing (Qing/ Minguo): based on the map in 1911 and 1934.

Fig. 5: Street typologies based on paving and width in old Beijing (Qing/ Minguo).

Fig. 6: Development of railway from 1920s to present. Thick orange lines represent new railways added after previous periods.

The tram and bus systems form the focus of this part of the paper. These served mainly the scale of the emerging metropolitan city. The first tramline in Beijing was constructed in 1921. From the map above [see fig. 8] we can see the north part functioning as a ring to facilitate movement inside the inner city, where the upper class lived. In the outer city, it strengthened a 'cross road' structure in the middle. The history of the tram in Beijing was quite short. After the foundation of the People's Republic, the tram was removed and replaced by buses and 'Wu Gui Dian Che' (literally 'electronic bus without track')[11] From the 1960s, the bus system in Beijing was classified into regional, suburban and city bus systems, based on the ranges they served. However, as we can see from the map below, the distinction between the three types was quite clear in 1968, but not in 2008. With rapid urban development, the number of bus lines also kept increasing. As a result, there was more and more overlapping, especially between suburban buses and city buses.

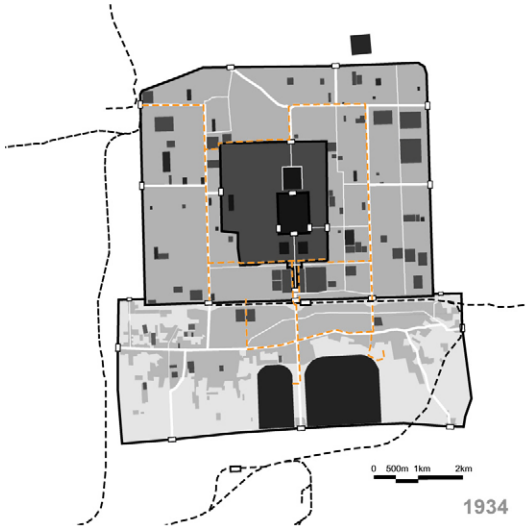
Another means of classification could be based on the actual distance of the bus line. In the table above we divided the bus lines into seven categories. From this table and the map [see fig.8], we can see that in the last forty years the numbers of bus lines of almost all ranges have greatly increased. The role of regional bus lines has however been maintained, while city and suburban buses have become almost indistinguishable. If we consider only the length of the bus line, then a division could be drawn at the 40-50km range, and this applies for all three different years listed. Now, if we could talk about the definition of the city from the perspective of buses, after the removal of the city wall, we could say what were suburbs of Beijing in 1968 have been totally urbanised today. In this sense, the city and suburban bus systems have together replaced the role played by the city walls in history, defining limits and forming a new territory which we will later call metropolitan Beijing.

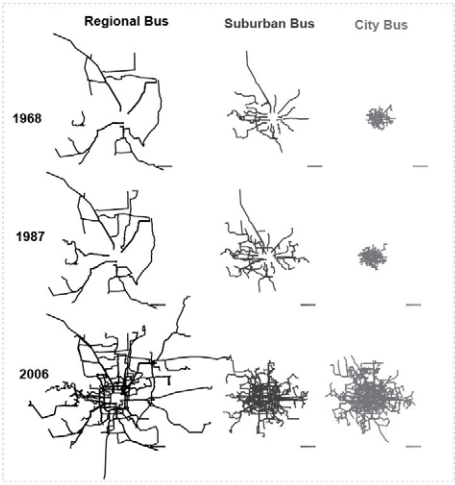
From the map above [see fig. 9] we can clearly see that most new bus lines opened between 1987 and today were located along the 3rd and 4th ring road of Beijing. Considering that buses in Beijing were the best-used form of transport at the end of the last century, this means the area around the 3rd and 4th rings has become a very centralised part of everyday life in contemporary Beijing. This point will be further demonstrated in the next part of the paper. Of course, this network expansion is also a historical process: in 1968 or 1987, a bus stop in a town or village functioned similarly to the way a regional train station does today. But with metropolitan development, the buses became more available at lower scales as connections between one neighbourhood and another.

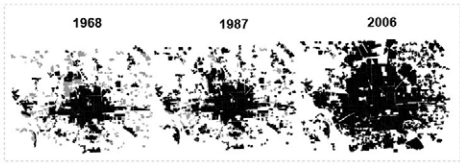
The map above [fig.10] presents neighbourhood inter-connectivity in the bus systems in 1968, 1987 and 2008. The number inside each neighbourhood is the number of all other neighbourhoods directly connected to it by bus lines, without having to change to other lines. From this study, we can see that the average number of connections inside the 3rd ring has been increased from less than 100 to more than 300. It is also very clear that the city centre (inside the 2nd ring), which was connected well by buses in 1968 and 1987, has been left behind and is less connected than the area around the 3rd ring in 2008. In the latter part of this paper we will superimpose these maps on the distribution of shops in 1987 and 2006, and show a corresponding shifting of functions from metropolitan to lower scales.

3.4 Recent development of the metro as a further intensification and extension of the metropolitan scale

Beijing's metro system was initially planned as a defence system against the threat from the USSR in the 1950s. The first line was finished in 1969: however, it didn't fully open to the public until 1981. This system included the line underneath Chang'an street, and the north part of the former city wall. In







Distance (km)	1968	1987	2008
0-10:	22	41	37
10-20:	46	69	188
20-30:	11	18	108
30-40:	6	10	50
40-50:	0	1	19
50-60:	4	5	29
60+:	5	5	21
Total:	94	149	452

Fig.7: Tramlines (orange dash line) and railway (black dash line) in Beijing 1934.
Fig.8: Three types of buses and their service range in 1968, 1987 and 2008 (left); connected neighbourhoods by bus (top right); bus line distance distribution (below right).

the next twenty years, Beijing's metro system developed quite slowly. However, after the successful application to host the 2008 Olympic Games, this process speeded up dramatically. In 1999, line 1 extended to Sihui. In 2003, line 13 was 40.5km long and connected Beijing with many satellite towns in the north. In 2007, line 5 was 27.6km long, running through the whole city in a north-south direction. In the map below, the construction and future plans of the metro system in Beijing are shown. [see fig.11] It is still a system in development, and so far it is hard to see the influence of this system on the distribution of centralities, especially in peripheral areas. Even so, it is possible to speculate that, with the future development, the metro system in Beijing will take over the role city and suburban buses played decades ago and become the means for a further rescaling of the city.

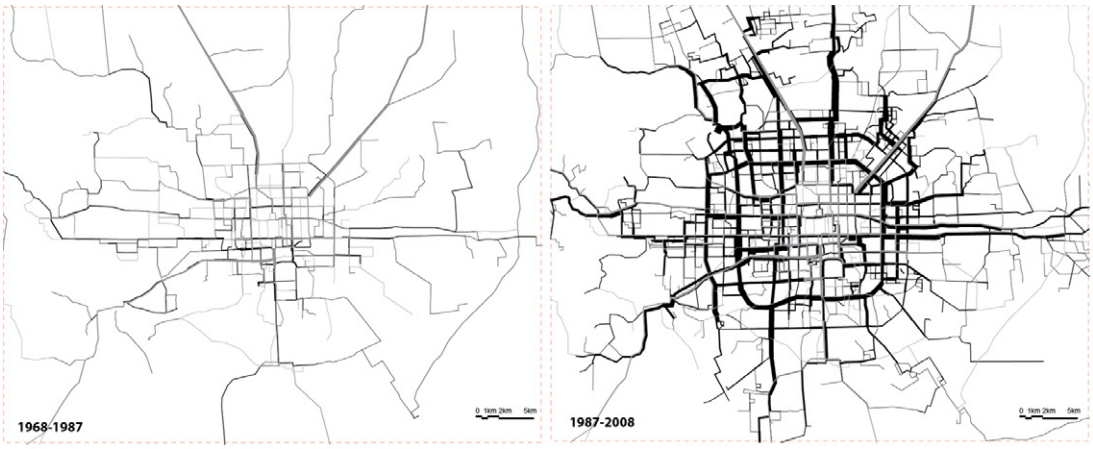
3.5 'Scale structure' based on different technical objects

This part of the paper deals with two questions regarding the analysis of changing movement networks. One is the 'what' question: what actual transportation networks, based on what specific technologies. The other is the 'for what' question: the question of the scale structure for which technical networks were operating. After presenting how actual systems have developed, we will re-group them according to the scale of movement they support, and we will then see the morphological patterns in Beijing in terms of regional and city scales respectively. The metropolitan scale actually emerged in between these two scales and started to substitute the scale of the city through the rapidly expanding bus system in the end of the last century and the development of the metro system in this century.

The research will focus on the years 1934, 1968, 1987 and 2006 respectively. All transportation networks mentioned before will be divided into two scales: regional movement networks as connections between cities, towns and villages; and city movement networks as connections between neighbourhoods. Under this framework, train and highway systems will be considered as elements of a regional scale, while ring roads, metros, and most buses will be considered as elements of a metropolitan city scale. It should be noted that the ring roads, as parts of the highway system, perform an important 'overlap' function between regional and metropolitan city scales. The regional bus system will be defined as having a range over 50km, based on a previous study. Based on these methods, we made the following maps of a two-scale movement network model of Beijing. [see fig. 12 and 13]

At the regional scale, we can see that between 1934 and 1987, the normal roads (also supporting the regional bus system) were still expanding towards the rural areas. At the same time the railway system was developing into a well-connected network. Between 1987 and 2006, a highway system emerged and created new direct fast links to bigger cities in and out of this region. As a result, certain nodes previously connected into the region were by-passed. For example, a new connection to Tianjing, a port city in the southeast, has made Tongzhou function less strongly as an important gateway for Beijing. In general though, new transportation networks were constructed to strengthen the privileged position of certain connections. The new spatial hierarchy built for the most part on a pattern that existed before, supported by technologies of previous periods, but systematised and strengthened that pattern into a regional structure.

When we zoom in to the city scale it becomes rather clear that as the city expanded to become a metropolis, the city scale roads in Beijing evolved into a more regular and systematised orthogonal grid form. This could be seen as a technical solution to automobile-based movement at this scale, but it also has some side-effects. Comparing the situation today with 1934, it is clear that navigat-



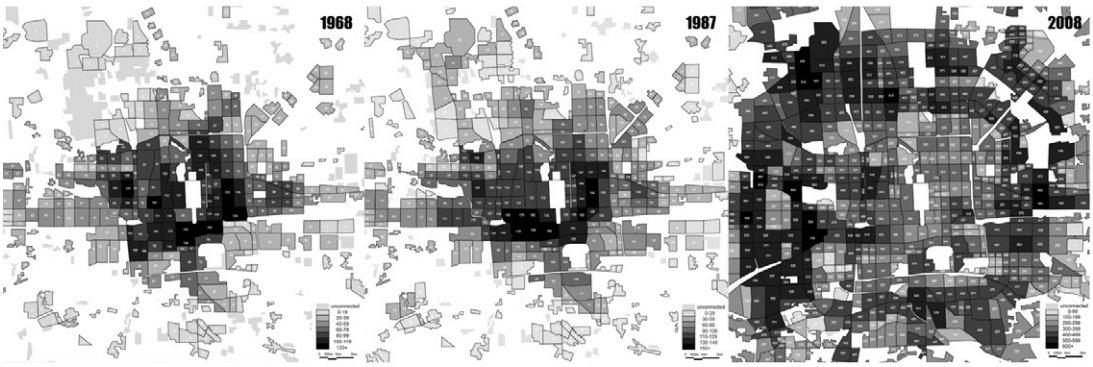


Fig. 9: Growth of bus lines: 1968-1987 (left); 1987-2008 (right); the thickness of line indicates the number of new lines opened. Grey represents the earlier period, black represents the new lines added in the later period.

Fig. 10: Inter-connectivity of neighbourhoods by direct bus lines (no change to other bus line) in 1968, 1987 and 2008. The number showed inside each block is the number of other neighbourhoods which are connected to this one by a single bus line. The darkness presents the relative connectivity in that period: the darker the higher.

Fig. 11: The development of the metro system in Beijing as a process of metropolitanisation.

ing inside the city has become much easier. There has been a reduction of labyrinthine roads in the inner city as the city grid has been systematised into something clearly different to neighbourhood roads, and today it is merely a question of going out of your neighbourhood and then stay on the city grid to your destination. Taxis and local busses are incorporated into this pattern. Therefore, although these new technologies normally regularised social-spatial patterns already there, they were constructed for contemporary purposes and transformed the environment to contemporary needs. As this study shows, in 1934 and 2006 we can see urban space organised into patterns reflecting different scales. The tools (the sets of technical devices) used to realise these scale structures are different, and this difference leads to changes of the spatial structure: starting with the removal of the city walls and gates; then the regularisation and extension of the city grids towards the suburban areas; then over time the terminals of modern transportation networks like trains stations and highway exits become the new gateways of the city. All of these processes are crucial for Beijing's metropolitanisation.

What does this analysis mean for the Central Place and Central Flow models? Firstly, the movement network model we constructed here has as its main purpose the representation of the scale attributes of movement flows. Thus we can say that it is a kind of Central Flow model at the scale of the metropolitan city, since what reveals the hierarchical structure is the flow. What about urban central places then? As we mentioned, the new transportation networks nowadays create well-defined scale structures, and this scale structure offers a framework for urban places to emerge. Our proposal is that the contemporary urban place is not dependant on its simple (distance-related) geographical relationship with other urban places, but is dependant on how it is connected in different layers of the scale structure made of movement networks. Therefore, in the next part of the paper, based on the data of retail and market places in Beijing, we will try to investigate two things: firstly, is there a transformation in the spatial distribution of centres from historical Beijing to the present? Is this the 'historical move from the logic of Central Place to Central Flow' proposed by Neal? Secondly, what is the spatial logic for the emergence of metropolitan centres in the scale structure of the city?

4. Changing metropolitan scale centralities as a consequence of changing scale structure

4.1 Introduction

After presenting the changing scale structure, in this part we will analyse the morphology of metropolitan scale centralities using the data of retail and market places in 1924, 1987 and 2006. During the analysis, the data will also be compared with Gao's Central Place model.

'Centrality' in this paper refers to a cluster of retail, markets or entertainment. Thus, metropolitan centrality means that the majority of customers of those commercial activates should come from the whole metropolitan area. Practically, it is problematic to link the type of goods or services being offered by those shops with its scale of customers, because it is very difficult to get reliable data on actual customer distribution for all shops. Nevertheless this is a widely used method in Central Place research on retail geography. To take one example, the digital market in Beijing in the 1990s was definitely operating on the metropolitan scale, because there was only one market in 'Zhongguancun' at that time. Ten years later this type of business has become widely distributed but it is very difficult to get reliable data on actual customer distribution for particular shops. This is especially the case with historical data and we therefore have to try to make plausible estimations. In this part of the research our estimation is based mainly on the most dominant type of retail, services or wholesale market in different periods.

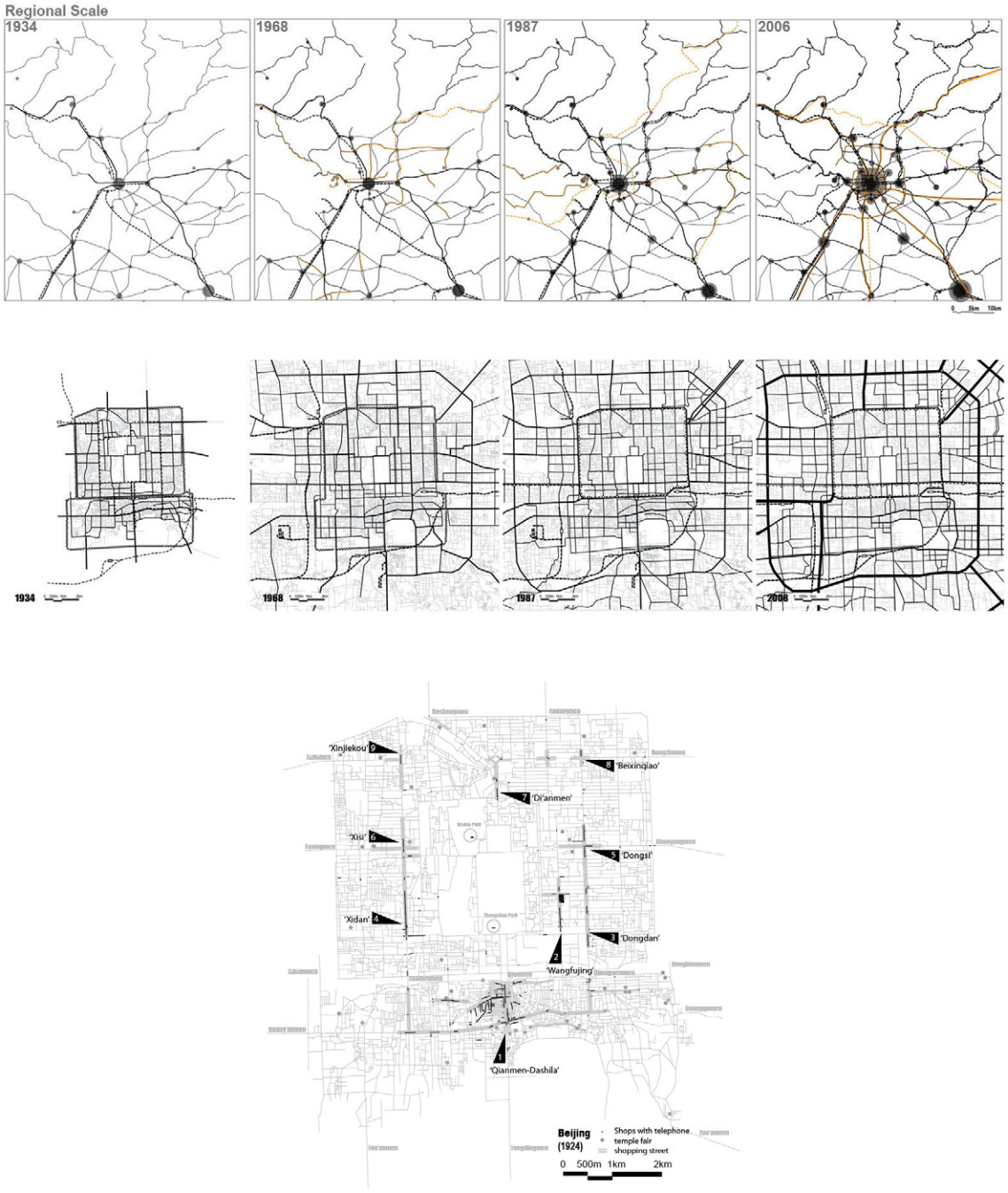


Fig. 12: The development of scale structure in Beijing from 1934 to the present on regional scale. Orange lines represent new networks based on previous maps.

Fig. 13: The development of scale structure in Beijing from 1934 to the present on city scale. Thick black lines are regional scale networks, thin black lines are city scale networks

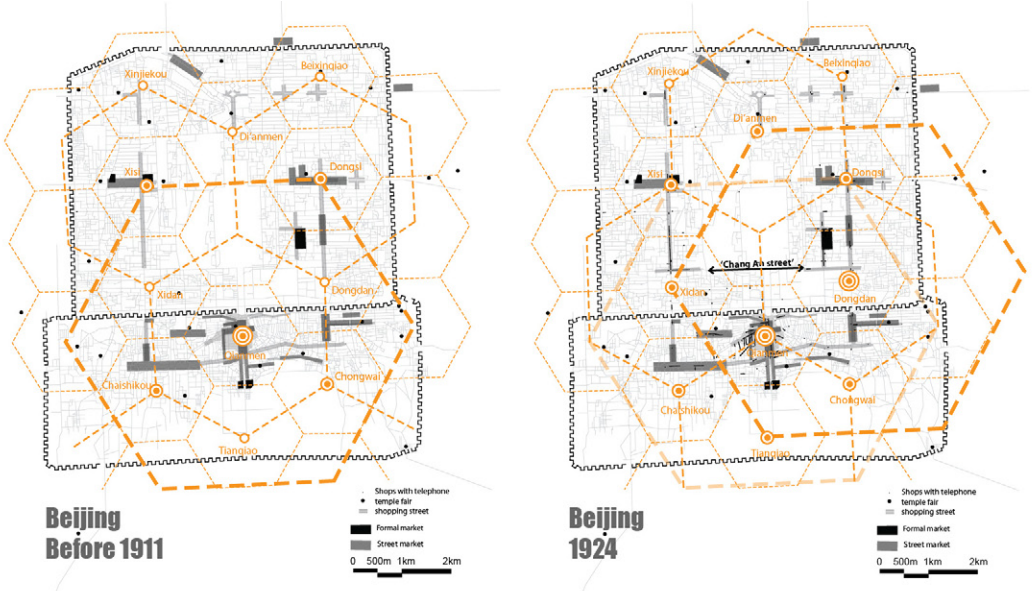
Fig. 14: Distribution of shops in Beijing 1924.

4.2 metropolitan centralities in 1924

In his book *Zui Xin Bei Ping Zhi Nan* ('New Guild Book of Beijing'), written in 1924, Tian Yunjin listed detailed street names, social customs and all shops with a telephone in Beijing. In a way the book functioned as the yellow pages of that period. Based on this material we mapped all retail and entertainment-related functions listed. Considering the fact that in 1924 the telephone was not that widely used, this list would already tend to reveal higher-scaled commercial activities and this data could to some extent reflect metropolitan scale centralities even before we consider types of functions. To give an indication on the distribution of commercial activities without telephone, we also included shopping streets and temple fairs in light gray based on *Beijing Li Shi Di Tu Ji*.[12]

As the map shows [see fig.14], it is clear that most of the shops plotted were located along the main streets of Beijing: Xisidajie (marked 4, 6 and 9) on the west; Dongsidajie (marked 3, 5 and 8) on the east; Qianmen-Dashila area (marked 1), located on the main crossroad in the outer city to the south. Wangfujing (marked 2) was located on a relatively less important street; however, Dong An market, as the leading market in Beijing was located on the crossing of Wangfujingdajie and Donganmendajie, which was the gateway to the Forbidden City and Foreign Embassy area. When we look at the location logics of specific functions, two types could afford to be located in less visible spaces away from the main roads: one was western style restaurants, which were mostly located in parks (grey dashed circles on the map) and brothels, which were all located in the central Qianmen-Dashila area yet clearly favoured hidden spaces.

In his paper, Gao used the Central Place model to analyse the changing centrality between the Qing and Minguo periods. [see fig.15] To summarise Gao's research: in the Qing period, Beijing's highest level of central place was the Qianmen area serving the whole city, and between the inner city (north part) reserved for Manchurian people, and the outer city (south part) reserved for Han people. The Caishikou and Chongwai areas emerged as second-level central places in the outer city, while other places like Xinjiekou, Di'anmen, Beixinqiao, Xidan, Dongdan and Tianqiao were third-level central places serving local areas. In the Minguo period, Dongdan emerged as a new first-level central place for reasons of politics, transportation and social demography. The second reason is very interesting and relevant for this paper: Gao himself claimed that changing transportation networks were a 'main reason' for the transformation of central places. The main change to the road system in that period was the connection of Xidan and Dongdan through the new Chang'an street (marked with black arrows). The geometric centre of Beijing was occupied by the Forbidden City, but the new Chang'an street broke this barrier. This meant the role of Qianmen as the obligatory point of passage for movement between the eastern and western parts of the city was reduced and centrality shifted to the north. As a result both Xidan and Dongdan were upgraded, but the actual development of Dongdan as a first-level central place was in Dong'an market in Wangfujing street to the northwest of the ideal situation in the model. What Gao also found interesting about this rescaling of central places was the projected rise of the Tianqiao and Di'anmen areas as the lower central places of Dongdan. This could, if it happened, be seen as empirical evidence of the spatial logic of the Central Place model, since the relocation of a higher-scaled central place could initiate the rescaling of the system as a whole. However, he did not give any detailed data about these changes. On the contrary, in a later part of his paper, he attributed the slow development of Di'anmen to it being an area with a higher percentage of poor people. Di'anmen apparently had not been upgraded as he had expected. In addition, there were other problems dating back to the times of development. In the first place, the Tianqiao area had already for a long



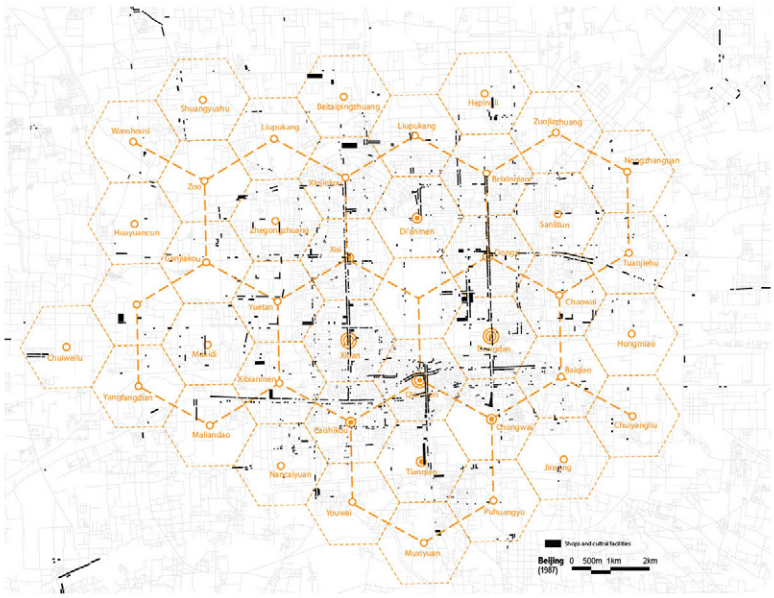


Fig. 15: Superimposing Gao's Central Place model of Beijing in Qing (left) and Minguo periods (right) on the actual distribution of shops and markets.

Fig. 16: Superimposing Gao's Central Place model of Beijing in the 1980s (Gao, 1989) on the actual distribution of retail, market places and cultural facilities.

time been a vital area not only for local people, but also for immigrants from other parts of the country, and a labour market of poor people at the city scale. Secondly, Di'anmen never achieved the same level of centrality as Longfusi, and Longfusi (Dongsi) didn't show any signs of decline due to the competition with Wangfujing at the time. In a much later period (the 1990s), the Di'anmen area was indeed upgraded, and the Longfusi area downgraded, but that was due to the construction of Ping'an street as a new through route for the inner city. Thirdly, while the upgrading of the Xidan and Dongdan areas into first-level central places indeed followed the construction of Chang'an street as a through route, this also happened much later, especially in the case of Xidan. The problem of time is important for this paper because it could also help us understand the power of infrastructure compared to other social or political factors. Indeed, urban development, especially for a capital city like Beijing, is strongly affected by politics. Once the Forbidden City and foreign embassies were located where they were, they started to attract a higher level of commercial and cultural activities, and all of these contributed to the Wangfujing area developing into a metropolitan-scale central place. But infrastructural changes such as moving the railway station from Qianmen to Dongsi, the construction of Chang'an street as a through route, the opening of metro lines, all reinforced and played an active role in this process. These interventions were strategic and were used to fulfil and stabilise the intentions of emperors and planners.

Despite all the problems with the Central Place model built by Gao, what is clear so far is that to actualise Central Place Theory, movement networks will be one of the most important factors. Now the question is: is it possible to build up an alternative model for explaining the changing centralities of Beijing based on changing movement networks related to scale? In the next part, we will try to compare the movement network analysis with the morphological study of centralities between 1924 and 1987.

4.3 Metropolitan centralities in 1987

The data for Beijing's retail and market places in 1987 were based on an atlas named *Beijing Shi Qu Di Tu Ce*, published by China Map Press.[13] The legend system in this map collection already indicates scalar differences: for example, a large and famous barbershop or an important public bath is represented by larger circles than less prestigious ones. Also catering has three categories: 1, 'fanzhuang' (big restaurants); 2, 'Fengweichaocai' (stylish small restaurants); 3, 'xiaochimianshi' (snacks, noodles, fast food). Based on these categories and the detailed functions of shops, we have classified them into three levels: the first rank was intended to cover functions with customers coming from the metropolitan area and included department stores, famous or big restaurants, barbershops, clock shops, book stores, bike shops (in the 1980s, buying a bike was as big a deal as buying a car is today), opera houses, cinemas, children's or worker's clubs. The third rank included small snack and noodle shops and food shops ('fushidian'), functions which in that period were indicators of customer usage at the neighbourhood scale. All the other types of shops were considered to operate on a middle scale in between the metropolitan and local. On the following map we have superimposed the Central Place model proposed by Gao on the data for shops. [see fig.16]

As we can see, in the central part of city Gao's Central Place model of Beijing matched with the reality in a much better way than did the edges of the centre. Gao himself claimed that it was because urban development in 1987 had not yet fully actualized the model. Another thing missing in Gao's use of the model is a concern for the changes in the transportation system. Clearly, the transportation system in 1987 is different to that in 1924, but in Gao's model the service range of the centres doesn't seem to reflect that difference.

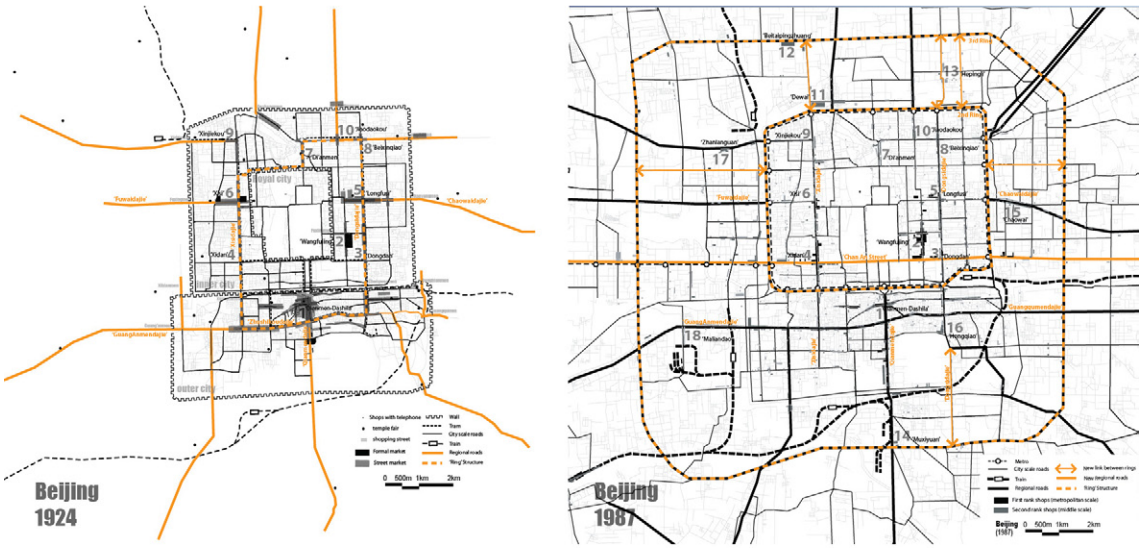


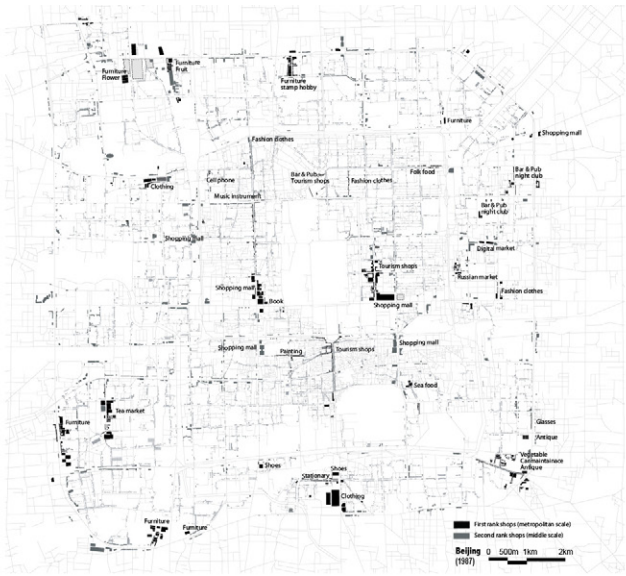
Fig. 17: Comparison of retail, market places and cultural facilities in Beijing in 1924 (left) and 1987 (right).
Fig. 18: Comparison of movement scale networks and metropolitan centralities in Beijing in 1924 (left) and 1987(right).

Comparing 1987 with the data of 1924 [see fig 17], we can see that inside the old city (inner city and outer city together) the distribution of metropolitan centralities underwent little change: the Wangfujing area grew faster and started to function as the leading shopping centre replacing Qianmen area; the retail in Xidan area started to concentrate near the new Chang'an Street, and the commercial activity expanded slightly outwards after the wall was removed, especially near where new roads were made by breaking old city walls. The case of Chang'an street is interesting. In the 1980s, it was further extended in both the eastern and western directions to Tongzhou and Shijingshan, making it into a new road of regional importance, which started to replace Chaowaidajie. This intervention was political and had to do with building a new functional and ceremonial axis. However, the power of infrastructure goes further than representation, and the upgrading of the Xidan and Dongdan/Wangfujing areas into metropolitan-scale shopping centres were side-effects of this change.

On the map above [see fig 18], we show a comparison of movement networks and metropolitan centralities in 1924 and 1987. In 1924, the shopping centres such as Longfusi (marked 5) or Xisi (marked 6) were not at the Chaoyangmen and Fuchenmen gates respectively, but rather at the crossing-points of Changyangmendajie-Fuchengmendajie and Dongsi/Xisi. In fact, due to the barrier effect of the Forbidden City, Dongsidajie, Xisijdajie, Zhushikoudajie and some other streets to the north of the Forbidden City functioned as a ring road. This was also where the tramlines were located, and they together mediated the movement coming from outside the city with that inside the city. This 'ring' (orange dash line) constituted the centre for movement inside the city, while the main streets ('Dajie', orange lines) were directly connected with gates carrying flow from the outside. We can begin to see this logic of the interfacing of outside and inside movements as generic for generating centralities. Being connected to the outside, while holding a central position inside a certain scale in terms of flow (not in terms of geometry), is the necessary precondition for centrality to emerge. The spatial logic of this alternative model will later be tested further.

Of course, the logic of the gateway is still valid: we know that informal markets or vendors gather near the gate and that it was an important place for public propaganda. But based on the distribution of metropolitan centralities in 1924 and 1987, we can see it is rather the convergence of more than one movement scale that is important, while the gate itself is only one of many technologies used for controlling movement. Previously the gate had created a clearly defined border between inside and outside, but central places inside the city will depend also on where flows from the outside meet internal movement patterns.

In the map of 1987, we can see that the inner ring structure of 1924 has been weakened due to the extension of the Chang'an street and new connections with suburban areas. A new ring road, the 3rd ring today, has started to emerge in the suburban area.[14] However, because of building lagging behind infrastructure, in 1987 this new ring had not yet become central in the city movement structure. Instead, together with the northern part of the 2nd ring (where the former inner-city wall was located), this double ring structure outside the city provided potentials for the future emergence of new metropolitan scale centralities. Some of these potentials had already been actualised where the rings met the extensions of radial streets such as Xisidajie and Dongsidajie. Examples are: Beitaipingzhaung area (marked 12), Chaowai area (marked 11), Hepingli area (marked 13) etc. Other new links less well integrated[15] into the old fabric (orange line with arrows on both ends) between this double ring have less effect.



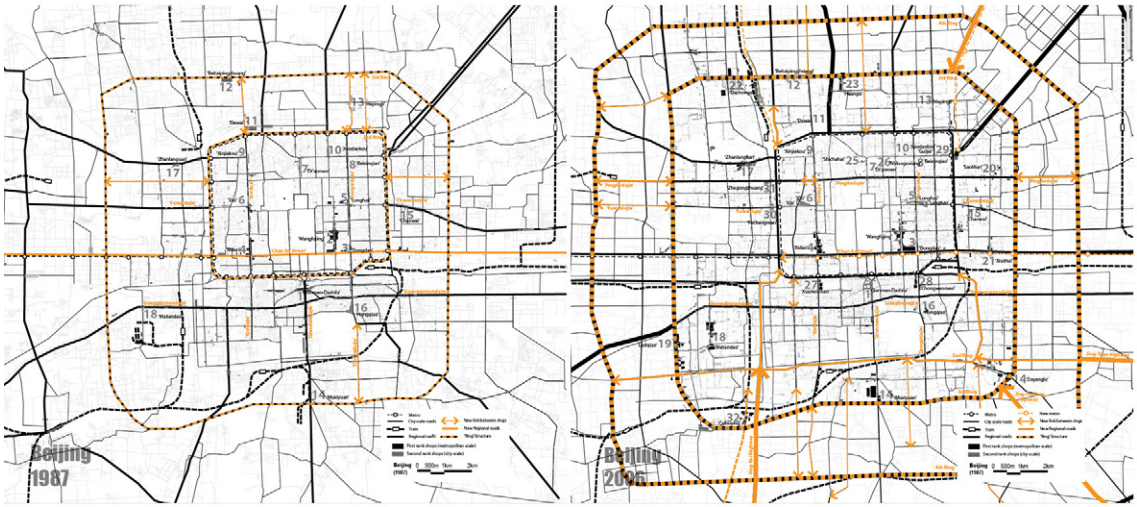


Fig. 19: Metropolitan centralities in Beijing 2006.

Fig. 20: Comparison of movement networks and metropolitan centralities in Beijing in 1987 (left) and 2006 (right), orange lines show the new links or roads upgraded from previous periods.

4.4 Metropolitan centralities in 2006

Following a similar method, all the commercial functions in 2006 have been mapped and the metropolitan scale functions have been sorted out. Within the 3rd ring, all commercial areas with specific identities have been highlighted and plotted. [see fig. 20]

Comparing this map with the situation in 1987 [see fig. 21], what is immediately apparent is the role of the 3rd ring road as a generator for new metropolitan scale centralities related to everyday life. Meanwhile many centres inside the 2nd ring road have been transformed into areas for tourism or leisure. With the rapid urban expansion in these 20 years, the 3rd, 4th and even 5th rings have started to function as mediators of internal and external movement, while the 2nd ring has become less accessible from regional highways. Some new commercial areas have emerged where the 3rd ring meets the regional highway: the Dazhongsi area (marked 22), Huangsi area (marked 23), Dayanglu area (marked 24), Muxiyuan (marked 14), Caihuying (marked 32) and Liuliqiang area (marked 19) for instance. Chang'an Street's function of supporting metropolitan scale movement has been strengthened, also considering the extension of metro line 1. As a result, we see the commercial functions booming in the Wangfujing/Dongdan area (marked 2 and 3) and Xidan area (marked 4). Ping'an Street has been constructed in 1998 and formed a second straight through route in the inner city. This intervention has had two effects: on the one hand, it has revitalised some old lower-scale shopping areas such as Shichahai (marked 25), Di'anmen (marked 7), and Naluoguxiang (marked 26). In this way it has acted in a similar fashion to Chang'an Street to the south in drawing centralities through the centre. On the other hand, it has further diminished the role of Fuchengmen-Chaoyangmendajie, which was the only through route in the inner city in 1924. As a result, the Longfusi area (marked 5) and Xisi area (marked 6) have become further downgraded.

As we can see from the analysis above, movement networks with scales could offer us a model by which to reveal the spatial logics for the emergence of particular metropolitan centralities in meetings between scales, but what about actual transportation networks? We will use bus connectivity as an example to analyse this point.

As mentioned in the previous part, the bus network in the 1980s was still well used by most people in Beijing, because in that period private car ownership was very low. The connectivity by bus corresponded very well with the distribution of centralities. [see fig.21] On the left map, four main shopping areas (1,Qianmen; 2,Wangfujing; 3, Dongsi and 4, Xidan) were connected well by bus. However, with the increase of the use of private cars, taxis, and the further development of the metro system, by 2006, the 'central area' based on bus connectivity had moved to the 3rd and 4th rings. Meanwhile, the traditional shopping areas (Wangfujing, Dongsi, Xidan, Qianmen) have retained their vitality, supported by other transportation systems like the metro. They are also becoming more and more used by tourists and rich people. On the other hand, other shopping centres (14, Muxiyuan to the south, 19, Liuliqiao to the south west, 22, Dazhongsi to the northwest, 23, Huangsi to the north, etc.) cater to the everyday needs of inhabitants. Comparing these with the high-level shopping areas in the inner city, they are all operating at the metropolitan level, but cater to different social groups. The total movement system of a city becomes highly complex and differentiated, facilitating specialisation in both area profile and transportation mode, and the growth of a polycentric structure of more and less specialised centres. In 2006, the overall importance of the bus system may have been reduced because people have more choices, but in reality it still serves well-connected neighbourhoods in Beijing located in central places emerging where the ring roads meet the regional highway. In general, we can conclude that studying specific actual transportation networks could

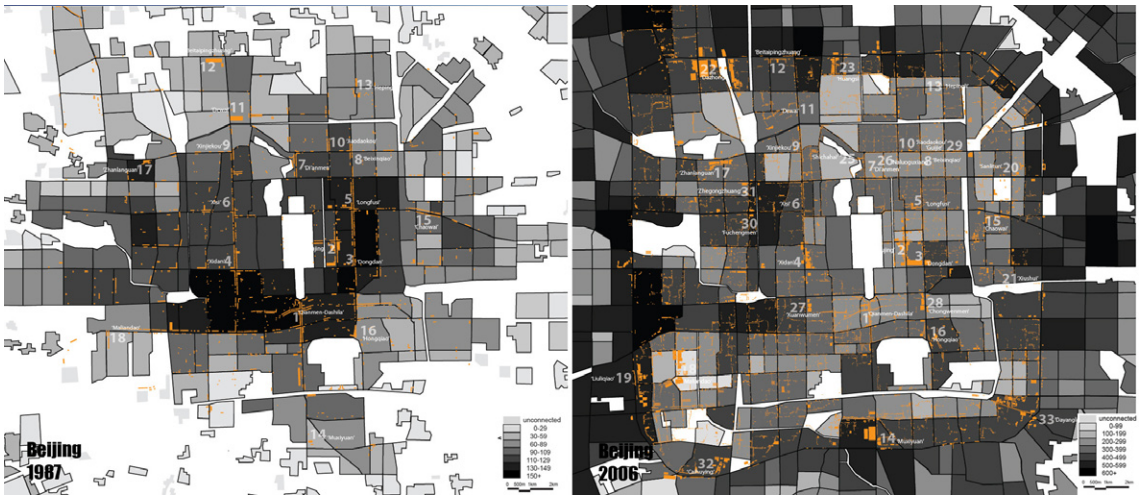


Fig. 21: Superimposition of shops on bus connectivity in 1987 and 2006 (The 2008 data of shops are unavailable, but there are few changes. The 2006 data are limited within the 3rd ring).

reveal common details about the central places they connect, such as the social/economical status of the customers and the characters and profiles of the central places.

5. Conclusions and discussion

This paper started by comparing 'setting boundaries' and 'making connections' as two strategies for regulating movement. 'Setting boundaries' refers to an understanding of space in hierarchies of enclosures and polarities of centre and hinterland, while 'making connections' treats spaces as networks with nodes that are connected together into a system. This opposition/unity duality reflects two urban models, Central Place theory and Central Flow theory. Seemingly opposed to each other, we argue that their logics together create the orders of centres and places in our cities. We argue further that these strategies are worked out today through transportation systems. The strategies and systems have been deployed together to make spatial entities like cities intelligible and functional. Therefore, our aim was to study changing movement networks and systems as a way of studying the metropolitanisation process of Beijing. Two research questions were asked: what is the role played by transportation systems in the formation of the Beijing metropolis, and; what are the spatial logics for the emergence of metropolitan scale centralities? From the empirical data on the development of transportation systems and the changing locations of retail and market places, we can draw the following conclusions:

Firstly, through the scale structure embedded in different technological systems in history (from paving and naming systems to today's highways), we can consider the scalar hierarchy in movement systems as a basic attribute of urban space, and this structure reveals a certain continuity in history. The metropolitan movement network, and even the metropolis itself, could be understood as produced by the development of multiple modern technical systems like ring roads, buses, highways and metros. These new networks together define hierarchies of movement scales in our contemporary urban space.

Secondly, on the scale of the metropolitan city, the relationship (such as spacing and hierarchy) between centralities cannot be effectively explained by Gao's Central Place model. The movement network model based on scale structure as a Central Flow model can capture more successfully the spatial logic of metropolitan centralities. Central places are being spatially organised in relation to the movement networks they are located on, not to other central places in proximity.

Thirdly, the spatial logic of 'interface'[16] between external movement and internal movement (movement across spatial hierarchies) as a general principle could explain the emergence of centralities as effects of different transportation technologies. But even in historical cities when walls and gates were the dominant movement regulating devices, this logic of interface cannot be reduced to a logic of the gateway. The logic of the gateway refers to a simple hierarchical interface between inside and outside. But the gateway also forms an obligatory point of passage for transportation networks, and the logic of interface requires scale hierarchy and flow. Centrality is deferred to the places where different flows intersect. From our empirical work, it follows that centralities were not located at the city gates in old Beijing, and neither are modern 'gateways' such as airports or train stations directly centralities. Metropolitan centralities have emerged in Beijing in the places holding central positions in a more local area on the one hand, while being connected to higher scale movement flows on the other.

There are several possible limitations to this research: firstly, Beijing is a specific case that needs to be relativised against other cases. Also, because it is a well-planned city based on ideologies and spatial principles, the strictly ordered spaces could be the result of those conventions rather than being

a product of a 'natural' space of cities. Secondly, we did not give any formalisation of 'central place' or any data on the actual distribution of flow. It may be too soon to say the spatial principle in Central Place model is not valid any more. There may be places at district or neighbourhood scales, or focusing on specific functions strongly related to daily needs (local food markets for example) where it may still hold.

Notes

1. In fact, the term 'Cheng Shi ' is made up of words that can also be used separately: 'Cheng' is an old word for 'city', while 'Shi' is more widely used in modern contexts after the presence of the wall became irrelevant. This change itself also reflects an evolution process.
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5. Except Gao's work mentioned before, there are many other researches based on Skinners paper and Central Place theory: Wang, D., *Stepping Out the Closed World: Social Study on Upper Yangzi Region (1644-1911)* (Beijing: Zhongguoshuju Press, 1993). Shan, Q., *Research on Market Places in Dingnan Region* (Beijing: People's Publication Press, 1999). Yao, Z., 'Retrospect on the Historical Research on Ancient China's Rural Society in 20th Century', *China's Agriculture History*, Vol.3 (2002), available on web: <http://www.lwlm.com/History/200807/99647.htm>, [accessed 19 May 2009]. Fan, H., 'The Temple Fairs and the Urban Market Structure in Peking during Min Guo Period', *Economic Geography*, 21, 1 (2001), pp. 90-94.
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10. Deng,Y. and Mao, Q., 'Analysis on the Scale and Structure of Beijing's Urban Blocks based on Qian Long Jing Cheng Quan Tu', *City Planning Review*, 27, (2003), pp. 58-65.
11. The first 'Wu Gui Dian Che' was used in 1956; the last tram was used in 1966. So the whole replacing process actually lasted 10 years. In term of the way buses and 'Wu Gui Dian Che' function in Beijing, there is no difference. Therefore, in this paper I will treat them as one and the same and simply call them buses.
12. Hou, R., 'Distribution of Shopping Area in Qing and Minguo Period', *Beijing Historical Map Collection*, Vol.1 (Beijing: Beijing Press, 1988).
13. 'Beijing Shi Qu Di Tu Ce', (Beijing: China Map Press, 1987).
14. Officially, what we call ring road today in Beijing should have no traffic lights and functions as an urban highway, thus the 3rd ring was put in use in 1994, but in 1987 it already had its shape, although there were traffic lights on the road.
15. 'Integration' is a space syntax term. A street of high integration value means it is 'topologically' better connected in the street system as a whole.
16. Read and Bruyns in their working paper, 'The Urban Machine', have theorised the relaying point between

high-scale movement network and lower-scale movement network as interface.

Biographies

Qiang Sheng has been undertaking Ph.D. research at Spacelab, TU Delft, since 2005. His work examines the relationship between changing centralities and movement networks. He graduated from TU Delft in 2004 with a M.Sc., and his thesis was entitled ‘Urban Labyrinth’, it also examined a similar subject and methodology. Before he came to the Netherlands in 2002 he studied Architecture at Harbin Architecture University and also won 1st prize in the National Architectural Student Competition (2000), 3rd prize in the Tianzhuo Architecture Competition (2000), and 2nd prize in the ‘Liangsicheng’ Cup Competition, (2001).

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Peripheral Cluster versus New Town: A Comparative Study on Two Types of Peripheral Developments in the Beijing Metropolitan Region

Jing Zhou and Lei Qu

1. Morphological Transformation of Beijing Metropolis

1.1 Background: spatial decentralisation as a planning goal

The traditional layout of Beijing city inherited since the Ming Dynasty was an orthogonal chessboard-like street pattern with the royal palace-Forbidden City in the central position. Other urban functions were organised around the centre.

During the post-war reconstruction period in the 1950s, Beijing, as the capital of China, started to grow as a mono-centric urban structure. The original idea was maintaining the administrative centre by building the new city upon the traditional centre. At the same time the concept of spatial decentralisation already appeared in the master plan of Beijing in the late 1950s, when heavy industries were required to relocate to the 'scattered groups' in suburban areas, defined in *Beijing Master Plan 1957 and 1958*, in order to meet political and environmental objectives.[1] More than 40 satellite towns were planned to associate with the mother city. However, the following decades, the 1960s and 1970s, formed a period divested of urban planning, almost leaving the city in anarchy. While the use of space in the central urban area had greatly intensified and industrialised, expanding from 109km² in 1949 to 340km² in 1978, the idea of spatial decentralisation became vague.

Responding to the fundamental socio-economic reform begun in 1978, a new master plan of 1982 proclaimed the identity of Beijing city as the 'political and cultural centre of the country'. The main aims of spatial planning were to regenerate the historical city, to adjust the land use pattern and to renew the dilapidated housing areas. The master plan also tried to recover the idea of 'scattered groups' by proposing ten 'peripheral clusters' in the near suburban areas (*Beijing Master Plan 1982*). However, this planning idea remained on paper during the 1980s. In 1993, facing the economic boom and new opportunities brought about by globalisation,[2] the master plan was revised again with the purpose of transforming the city into a modern international metropolis. Due to the tremendous expansion of the infrastructure network in the second half of 1990s, the city had been experiencing uncontrolled suburbanisation based on the mono-centric model, especially along main arteries. The planned 'periphery clusters' in near suburbs had finally been realised mainly as residential settlements. In the town system of 1990s, there remained 14 major satellite towns and 33 old satellite towns were redefined as central towns in the far suburban districts. [fig. 1] During this period, the far suburbs developed slowly.

In the past 40 years, the boundary of Beijing central city [fig.1] has been constantly enlarged. It covers an area of 1040km² in 2008, encompassing mostly 'periphery clusters'. In the latest *Beijing Master Plan 2004-2020*[3], a poly-centric spatial structure of the entire Beijing metropolitan region has been proposed to accommodate the rapidly increas-

ing population and new urban functions, in order to achieve a more balanced regional structure. Eleven new towns in far suburbs are designated to release the heavy burden of the central city (see note 1, 3 above). Most of them are in fact old satellite towns defined in the 1950s.

1. 2. Urban Expansion: Periphery in Transition

Within the Beijing metropolitan area, 62% of the territory is covered by mountains in the northwest, while only 38% of the land is available for urban use and agriculture. As a mega-city lacking the land resource, Beijing has been struggling to accommodate the rapidly increasing population and urban functions since the late 1990s. During the '*10th Five-Year Plan*'-period (2001-5), the total population rose quickly from 13.67 million to 15.38 million. Under the pressure of rapid growth and internal structural adjustment, Beijing has experienced a continuing suburbanisation in the 1990s. [table 1] The city was forced to expand and intensify the periphery, improving the compactness and forming new centralities.[4]

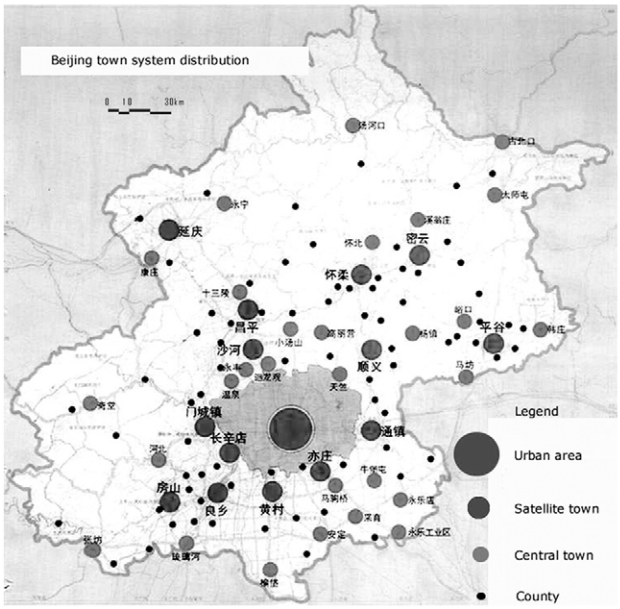
The acceleration of residential suburbanisation has resulted in big changes and new forms of residential spatial patterns on the metropolitan scale. Due to the large demand for new housing and the shortage of vacant land in the central urban district, new large-scale housing projects were rapidly developed in the periphery. These are mainly gated residential districts constructed by real-estate developers. Many of them occupy an area of more than 100 hectares. Moreover, high-speed light rails were constructed for improving the accessibility of the new residential developments in the periphery.

Meanwhile, propelled by the process of de-industrialisation, the population of the central urban districts decreased as people moved to the nearby suburbs; the spatial distribution of three industrial sectors was also differently affected. For instance, the primary industrial sector recorded a 60% decrease in the central urban districts, as well as an extensive decrease in the suburban areas. The secondary sector also decreased rapidly in the central urban area at a rate of about 30-40%, while it increased in the suburban areas, pointing towards a relocation tendency. Tertiary industries on the other hand grew very rapidly in both central urban districts and near suburban areas (see note 1 above).

1. 3 The New Master Plan of 2004-2020

The new version of *Beijing Master Plan* was released at the end of 2004 (see note 3 above). The main strategy is to restructure the city into a polycentric urban structure, with 'two urban axes and two development corridors'. Within this plan, new concepts, strategies and methodologies of urban development under the current globalisation context were developed for the Beijing metropolis, shifting the emphasis of urban development from the central urban area to the periphery. This was a starting point for a more holistic approach to regional planning, considering the urban and rural development as a whole. [fig. 2]

In the new urban strategies, the pattern of urban transportation and infrastructure network were considered essential components in shaping the spatial structure of metropolitan areas, especially along the development corridors. Originally, the transportation system was very automobile-oriented. The two metro lines in Beijing, which were built in the 1960s and 1970s, merely serve the central urban area. In 1998, the plan for rearranging transportation infrastructure networks was proposed. The main idea was to form a high-speed public transportation network by building thirteen new subway and light-rail lines within 50 years. Once finished, the over 400 kilometre-long network will fundamentally improve the accessibility of the metropolitan area. In this sense, the time-space distance between the central urban area and the periphery could be dramatically reduced, making it possible to develop



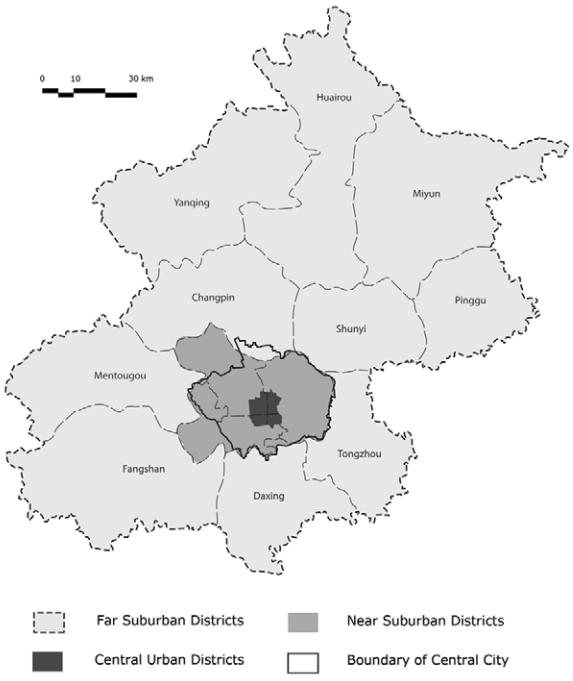


Fig. 1(a): Distribution of Satellite Towns in Beijing defined in 1950s. Source: Beijing Municipal Bureau of Urban Planning.
Fig. 1(b): Administrative Boundaries of Beijing Metropolitan Area. Source: illustrated by Jing Zhou, based on Beijing city map.

housing in the periphery for the middle-low income population, reducing the population density of the central urban area, where land could be used for more greenery.

However, such a long-term perspective has to deal with many uncertainties in the future and existing major challenges, one of which is the current housing system in Beijing (see note 4 above). Firstly, housing development in a market economy may fundamentally influence the daily commuting patterns of different social groups. As mentioned above, ten peripheral clusters have been planned in the near suburban districts since the 1980s to absorb urban functions and population. However, as will be shown later in the case-study of Tiantongyuan, some of them have almost turned into large-scale sleeping towns. Most people who live in these peripheral settlements still work in the central urban area, which even strengthens the monocentric urban structure. Such lessons were taken into account in the new master plan. Thus, the main strategy for the eleven newly-appointed towns is to enable them to become more self-relying by mixing living and working. In doing so, it is expected that the spatial structure of the Beijing metropolitan region could eventually be transformed to a polycentric model. [fig. 3]

There are important strategic structural adjustments of the industrial and economic development of new far suburban towns in the new master plan of Beijing, in accordance with the strategies launched already in the *Tenth Five-Year Plan* of the Beijing municipality (2001-5). These five years were the essential period of the urban fringe, transforming from rural economy to urban economy. Modern manufacturing and high-tech industries, such as electronic communication, new materials, ecological engineering and new medication, have been and will continue to be actively promoted. The share of service industries in new towns will be fostered by taking advantage of the abundant cultural heritages and good ecological environment. According to the master plan, the new far suburban towns will become comprehensive new centralities, not only helping release the population pressure from the central city, but also developing their own characteristic urban economy.

2. Comparative Case Studies

In order to gain some understanding of the suburbanisation process of the Beijing metropolitan area, two distinctive cases have been chosen for in-depth analysis. They are different in character, but both illustrate comparable problems. Tiantongyuan is a large-scale housing district planned on the fringe of the central urban area, part of a peripheral cluster, while Tongzhou is one of the three major new towns defined in the *Beijing Master Plan 2004-2020*.[5] By comparing these two cases, problems and new strategies considering spatial decentralisation will be analysed.

2. 1 The Case of Tiantongyuan

Planning and Development

In 1998, the Beijing municipal government planned Tiantongyuan as one of the key economical and affordable housing districts of the city, which are mostly large-scale residential areas oriented to the middle-low income population. The construction started in 1999, developed by Beijing Shuntiantong Real Estate & Development Co., Ltd., which is a privately-owned enterprise. Among the economical and affordable housing districts built since 1999, 76% were distributed in the near suburban areas, while 20% in far suburban areas, and only 5% in the central urban area. Therefore, as one of the first nineteen economical and affordable housing districts, Tiantongyuan actually represented the suburbanisation process of residential functions in the near suburban areas. [fig. 4]

Tiantongyuan district has a total of 5.2 million kilometres planned for housing floor area, with a

Demographic changes Increased (+)/ decreased (-)		Metropolitan area	Central urban area	Near suburban districts	Far suburban districts
1982-1990	People (1000)	+1589	-82	+1149	+521
	Rate (%)	+17.21	-3.38	+40.48	+13.12
	Annual rate (%)	+2.0	-0.43	+4.34	+1.55
1990-2000	People (1000)	+2750	-222	+2400	+572
	Rate (%)	+25.42	-9.5	+60.15	+12.73
	Annual rate (%)	+2.29	-0.99	+4.82	+1.21

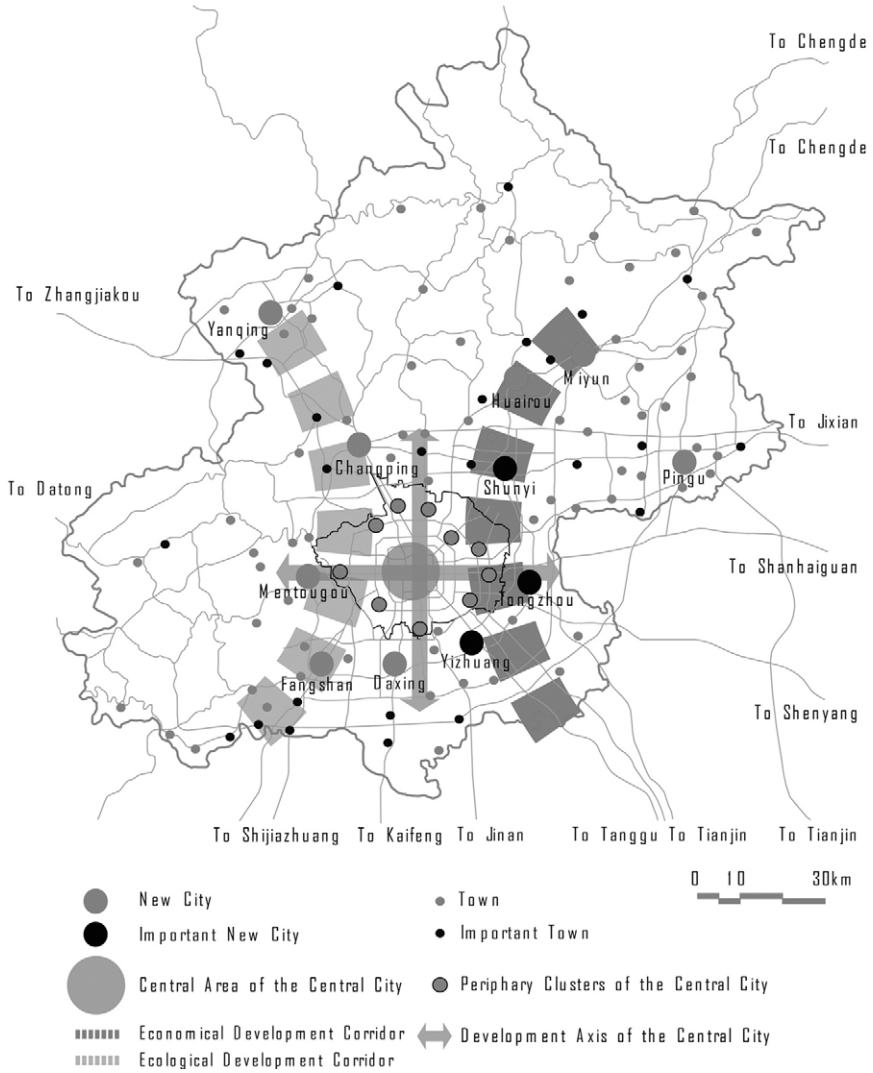


Table 1: Demographic changes in Beijing from 1980s to 2000s. Source: Beijing Municipal Bureau of Statistics: http://www.bjstats.gov.cn/esite/. See also Fig. 1 for spatial definitions of Metropolitan, central urban, near suburban and far suburban areas

Fig. 2: Integrated Regional Concepts of Beijing Master Plan 2004-20. Source: Illustrated by Lei Qu based on Beijing Master Plan 2004-20.

population of 300,000 residents. Since the housing district is so big that it has already reached the scale of a city, it should not simply have been planned as a pure residential area of high density. However, little thought was given to public facilities when plans were made. Problems started to appear when the first group of residents moved in, most of which were related to the mono-functional land use, such as a lack of educational and medical facilities, as well as commercial activities. [fig.5] What is more, accessibility was very poor. There were neither enough main roads nor a metro line connecting it to the central city, which led to heavy traffic jams on the commuting route during peak hours. All these conditions gave the early-stage residents a strong feeling of living in an inconvenient sleeping town. Security problems also became a concern of local residents.

Spatial Interventions

The government and the developer conducted investigations on the problems in the neighbourhood, based on which they made special spatial interventions. As the results show, accessibility has been improved after several main roads were built and connected to the existing road system. Moreover, metro line No.5 has been in use since before the opening of the Olympic Games in 2008, reducing commuting time to the city centre to half an hour. From the spatial point of view, the master plan of Tiantongyuan district was also modified. The mono-functional residential district was transformed into a lively mixed-use living area. A large-scale green public space was made in the western part of the district, surrounded by public facilities like commercial, cultural, medical and logistic services, which created new a working and recreational environment of high spatial quality.[6] [fig. 6]

Although people have criticised the population density of Tiantongyuan as being too high, this also brings vitality to the neighbourhood. Old people sitting in the green space and kids playing in the playground create a similar feeling to that of living in the city. However, the high presence of greenery, parking space, and better building qualities are the added value that cannot be found in the old neighbourhoods in Beijing central urban areas.

Demographics

As housing prices have increased dramatically in big cities like Beijing, Tiantongyuan is one of the several housing districts still maintaining relatively low prices, nearly ¼ of the average housing price in the central urban area. Such an advantage seems very attractive, especially to young people looking for their first house in the market. The average living space of the various housing typologies in Tiantongyuan district is around 80-200 m², which is larger than most of the apartments in the central urban area, where housing prices are high. Therefore it attracted not only the middle-low income groups, but also the middle-high income population. There were voices from the public claiming that this diminished the meaning of 'economical and affordable housing', which was supposed to target middle-low income group. Responding to such critics, new policies were made in November 2006, obliging developers to turn the economical and affordable housings that are larger than 140 m² per unit to market housing. Nevertheless, the actual social structure within Tiantongyuan district realised the mixing of different social groups, which reduced the possibility of residential differentiation among the peripheral housing districts. The problem is a lack of work opportunities within the neighbourhood or in adjacent areas for these middle-low income groups. They still have to commute to the central urban area every day, which exacerbates the heavy transportation load on the road system and newly-built light-rail lines.

Another special phenomenon in Tiantongyuan district is the 'Separation of Registered and Actual Residences'. Although there are already more than 150,000 residents in the neighbourhood, less than

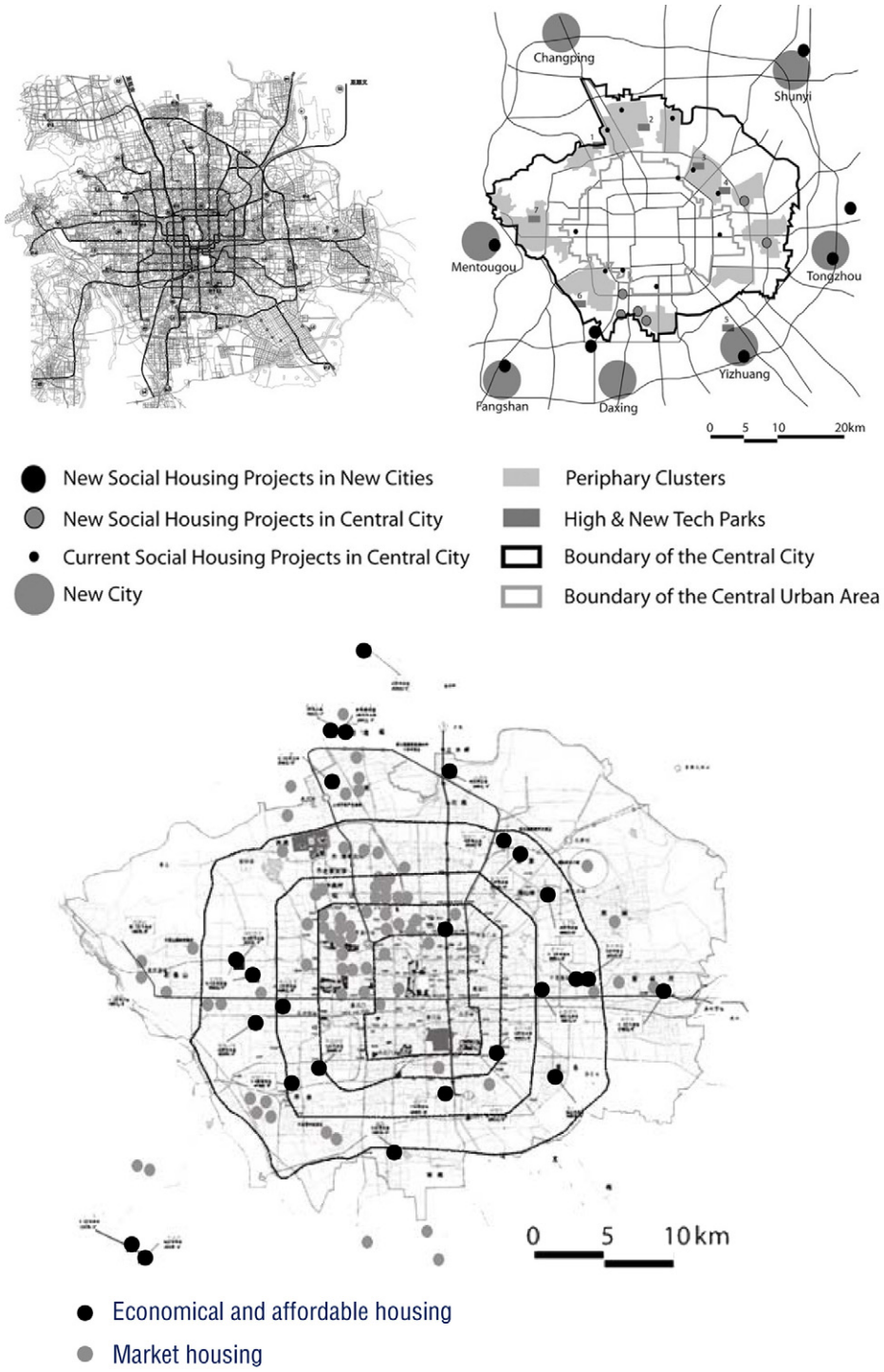


Fig. 3: Proposals of Public Transport System and polycentric urban structure in Beijing Master Plan 2004-2020. Source: Illustrated by Lei Qu based on Beijing Master Plan 2004-20.

Fig. 4: Location of Tiantongyuan district. Source: Illustrated by Lei Qu, based on Beijing city map.

10% of them have actually registered their home address there. This is partly because of the gap between urban and rural areas, for instance in the differentiated quality of education in schools. Those families having extra houses in the central urban areas prefer to keep their registered residence in the city area, so that their children can study in better schools and the elderly family members have better hospitals nearby. Moreover, there is a very high percentage of privately-rented housing in the Tiantongyuan district (about 20%), and a high percentage of floating population currently living in the neighbourhood. As implied, 'housing as investment' has become a common phenomenon.

Conclusions

The scale of the Tiantongyuan district is similar to a medium-sized city, which normally takes at least decades to build. Therefore, those emerging problems such as a shortage of public facilities and commercial/cultural functions are inevitable to a large-scale housing district newly built in a few years. The relatively large-size and low-price housing typologies with a better spatial quality than the old neighbourhoods in the central urban areas are very attractive to various social groups, and have resulted in the mixed social structure within the district. However, the lack of suitable work opportunities for the target middle-low income population is crucial, which caused large amount of residents continuing their daily commute to the central urban area.

Nevertheless, these problems should not be neglected, especially when linking them to issues of urban management. Developers form the main drive behind housing development. They hardly care about the provision of public facilities. However, accessibility and commercial activities are not only related to the daily life of local residents, but also to the spatial structure and urban development of the city as a whole. The municipal government has become aware of the inefficiency of the current urban planning and management approaches. Adjustments to housing development policies as well as the process of issuing building permits are being made to cope with the problems of the lack of public facilities in large-scale mono-functional housing projects. Public participation will also be integrated into the decision-making process, e.g. building permission will not be issued if the project is opposed strongly by the public.

2. 2 The Case of Tongzhou New Town

The Tongzhou District is located about 20 kilometres to the east of the centre of Beijing, and 16 kilometres from Beijing Capital International Airport to the south. Among the 11 nominated new towns in the far suburbs of Beijing, Tongzhou is endowed with the most strategic location. [fig. 7]

Historical Development

Tongzhou stands at the north end of the famous Grand Canal in China which meanders for 1794 kilometres. It had been transporting food supplies and building materials from southern China to the capital Beijing for over 700 hundred years, from the Yuan Dynasty till the late Qing Dynasty.[7] Tongzhou used to be prosperous in economic and cultural aspects. When the direct train connection replaced the function of the canal at the beginning of 20th century, the town began to decline due to the loss of its role as a harbour city.

Following the decentralisation strategy in the *Beijing Master Plan 1958*, heavy industries from the inner city and near suburban areas were relocated and dispersed to a dozen satellite towns. Tongzhou became one of the most busy and successful industrial towns at that moment.[8] The town expanded westwards from the bank of the Grand Canal in the direction of the central city. New housing construction projects before the 1980s were mainly traditional courtyard housing and accommodations for factory employees. These two typologies still dominate the old town of Tongzhou. During the 1980s Tongzhou

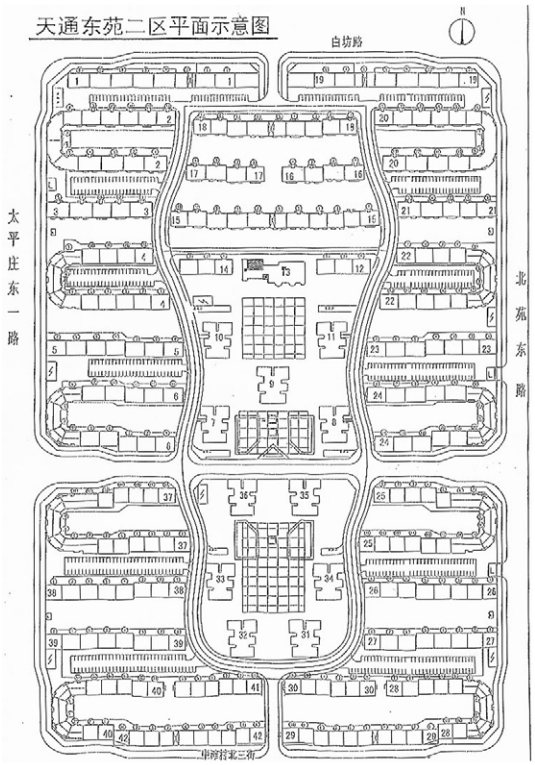


Fig. 5: Spatial morphology of Tiantongyuan district (a) neighborhood plan of zone-II east ; (b) Tiantongyuan bird-view.
Source: Tiantongyuan community website www.tty.com.cn.

remained the largest satellite town in Beijing based on manufacturing industries.

Since the early 1990s Beijing central city started to experience rapid growth and modernisation, which exacerbated the contrast between the central urban and rural areas, as well as the competition among the satellite towns. Some of them seized the opportunity to absorb the spill-over urban functions and population, and developed rapidly. For example, Changping became the town accommodating new expansions of university campuses, while most other towns, including Tongzhou, remained underdeveloped during this period. Driven by the emerging market forces, many unregulated housing developments started to take place rapidly from the bottom-up (see note 8 above). Due to the inefficient land management, developers mostly made deals directly with local villages, which resulted in a rather chaotic land use pattern. [9] [fig.8]

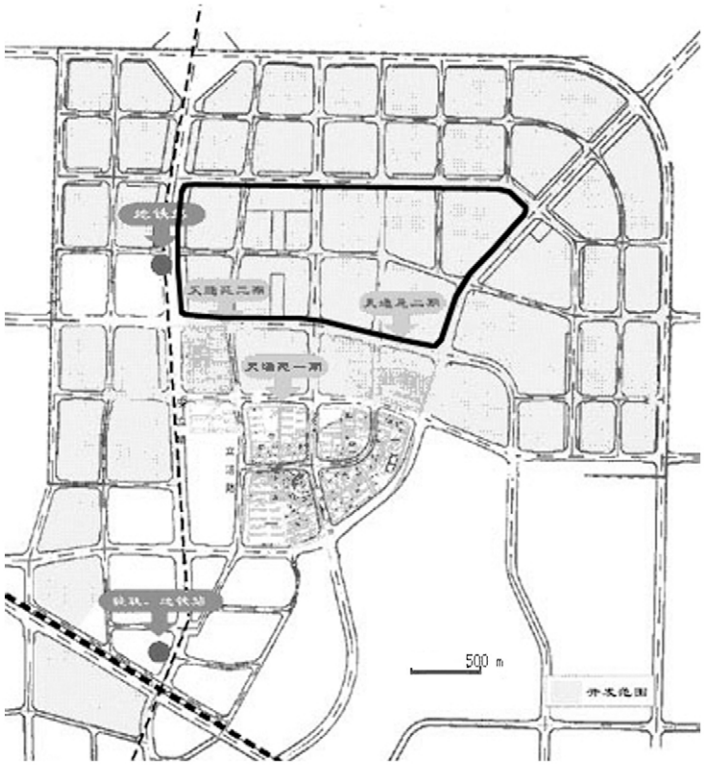
Spatial Expansion: Booming Real Estate Development

The real acceleration of the Tongzhou District started in 2001 [fig.8],[10] which is directly linked to a strategic project in Beijing central city - the construction of the Central Business District, which is only 13 kilometres from the centre of Tongzhou. Moreover, the accessibility between Tongzhou and the central city has been significantly improved. Besides the existing Jing-Ha highway, three more car connections and a light-rail line, which was the first line connected to suburban towns, were realised in 2004.

At the same time, Tongzhou municipality started to have higher ambitions for the '*10th Five-Year-Plan*' period (2001-5) by promoting real-estate development as the main economic growth pillar. This was also the period when the city of Beijing aimed to enhance tertiary industry and improve environmental quality. Many factories in Tongzhou were forced to shut down or moved out, leaving more vacant land for urban development. The situation of the housing market in the central city also changed. In the late 1990s, the old Danwei welfare-housing system was officially banned, which means housing has been thoroughly commercialised (see note 1 above). As it gets more difficult for middle-low income people to afford housing in the central city, the suburban market is becoming the new hot spot.

The joint forces from both top-down and bottom-up triggered a burst in Tongzhou's housing market. In 2001 for example, the built-up floor area for housing projects was the total sum of the previous 'five-year' period (1996-2000). [fig.8] From 2002 to 2004, the number went up to an average of 2 million square meters per year. In the peak year 2003, the amount of on-sale housing in Tongzhou even accounted for half of the total amount in the entire Beijing metropolitan area, which made it one of the most productive satellite towns. [fig. 9] There was a big rise in housing prices before and after 2001, from less than 2000 to 3200 Yuan/m². From 2002 to 2005 the price increased steadily by 9% per year to 4050 Yuan/m² in 2005. (see note 10 above) Even though, the average price was still less than 50% of that in the central city, which is very attractive to middle-low income groups.

Since 2005, the amount of new housing projects in Tongzhou went down sharply. As a result, the average housing price increased rapidly to over 6500 Yuan/m² in 2007. This is partly due to the reduction of available land in favourable locations in the town, but also largely influenced by the changing land-management policies of the central government, for instance the payment of land purchase in a lump sum since August 2004, stricter financial control on bank loans for real-estate projects since June 2005, and large-scale social housing programs in the central city in 2008. Furthermore, the new Tongzhou master plan of 2005 issued essential land use changes, resulting in more prudent urban governance on new urban developments.



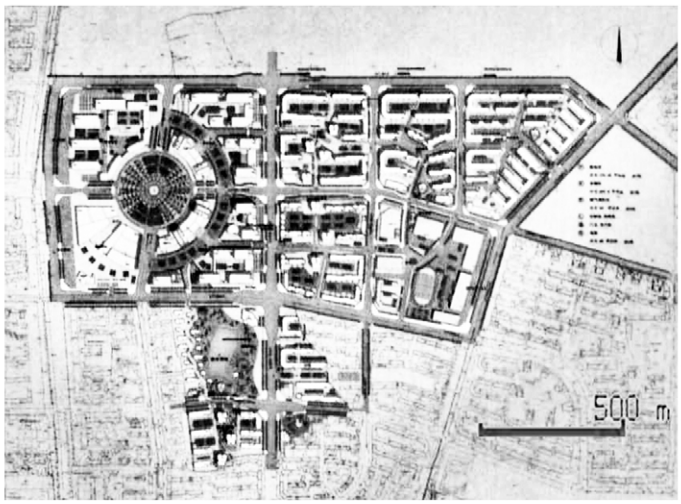


Fig. 6: Spatial intervention in Tiantongyuan district (a) master plan of Tiantongyuan District; (b) Spatial transformation-New civic centre. Source: Yang Liu, 2006, p. 129.

Between 2001 and 2008 a total sum of 9.42 million square metres of floor area has been constructed in Tongzhou, [fig. 8] out of which about 93.6% is for housing, 5.5% for commercial use and only 0.4% for office space.[11] The land-use pattern is quite homogenous. The main housing typology is middle-rise (6-9 floors) medium density apartment. [fig.10] Such typology is considered comfortable because of natural ventilation and sufficient sunshine, which can hardly be found or is very pricy in the central city. 93% of the total housing stock in Tongzhou belongs to this type; the remaining 7% is mainly villa and townhouse. There are three major popular residential belt zones in the town – along Batong light-rail, the bank of Grand Canal and Jing-Ha highway. Compared to new developments, the progress of urban renewal in the old town is slow, which results in an increasing contrast in terms of urban quality and image.

Demographics

When referring to Tongzhou, there exist two distinct territorial definitions. *Tongzhou District* encloses an area of 912 square kilometres, governing a central town and 10 counties. *Tongzhou New Town* refers to the central town, which is to be expanded to 155 square kilometres in 2020, according to the *Tongzhou Master Plan 2005-2020*.[12]

Between 1998 and 2008, the number of registered residents in Tongzhou District kept a steady level of 650,000 people with slight growth. [fig.11] The percentage of urban residents out of the total registered population mostly living in the New Town territory has increased from 29.5% to 47.5%, and reached 300,000 people in 2008. It is estimated that about 10,000 local farmers become urban dwellers each year because of the urbanisation process.

What is noticeable is the rapid increase of the unregistered residents since 2001, when the housing market started to boom. These are the people who report living in Tongzhou District to local authorities but officially register (Hukou in Chinese) in other municipalities. Their number reached 400,000 in 2008. These newcomers were mainly from Beijing central city and other cities. The ratio of the latter has increased from 33% in 2002 to 55% in 2006,[13] which means that Tongzhou has become a gateway for immigrants to enter the city of Beijing. The people who moved from the central city are composed of several groups: the young professionals, the 25-40 age group working mainly in the CBD area or Chaoyang District; people who relocated themselves because of urban renewal in the central city or who were looking for affordable/second apartments in far suburbs. According to an official estimation in 2007, there were about 270,000 commuters (about 30% of the total population) living in Tongzhou New Town and working in Beijing central city (see note 11 above). During peak hours, not only the traffic is quite congested, but also public transportation is overly busy.

The education level of the registered residents is much lower than the average in the central city. About 80% of them only had primary- and middle-school education, which is similar to that of other far suburban towns (see note 11 above). The majority of the unregistered residents is of a younger age, mainly between 20 and 40 [fig. 12] and also better educated. About 50% of them have a college degree. However, the ratio between male and female is about 2:1, which is quite unbalanced. Nevertheless, the strong and fresh impulse of the newcomers since around 2000 certainly influences the culture of the new town.

As discussed above, the social composition of Tongzhou New Town is quite diverse. On the one hand, it offers a variety of economic opportunities, which brings vitality to the new town. On the other hand, because of the large-scale new housing development and slow process of urban renewal, there is noticeable spatial segregation between the well-educated people, who aggregate in the new

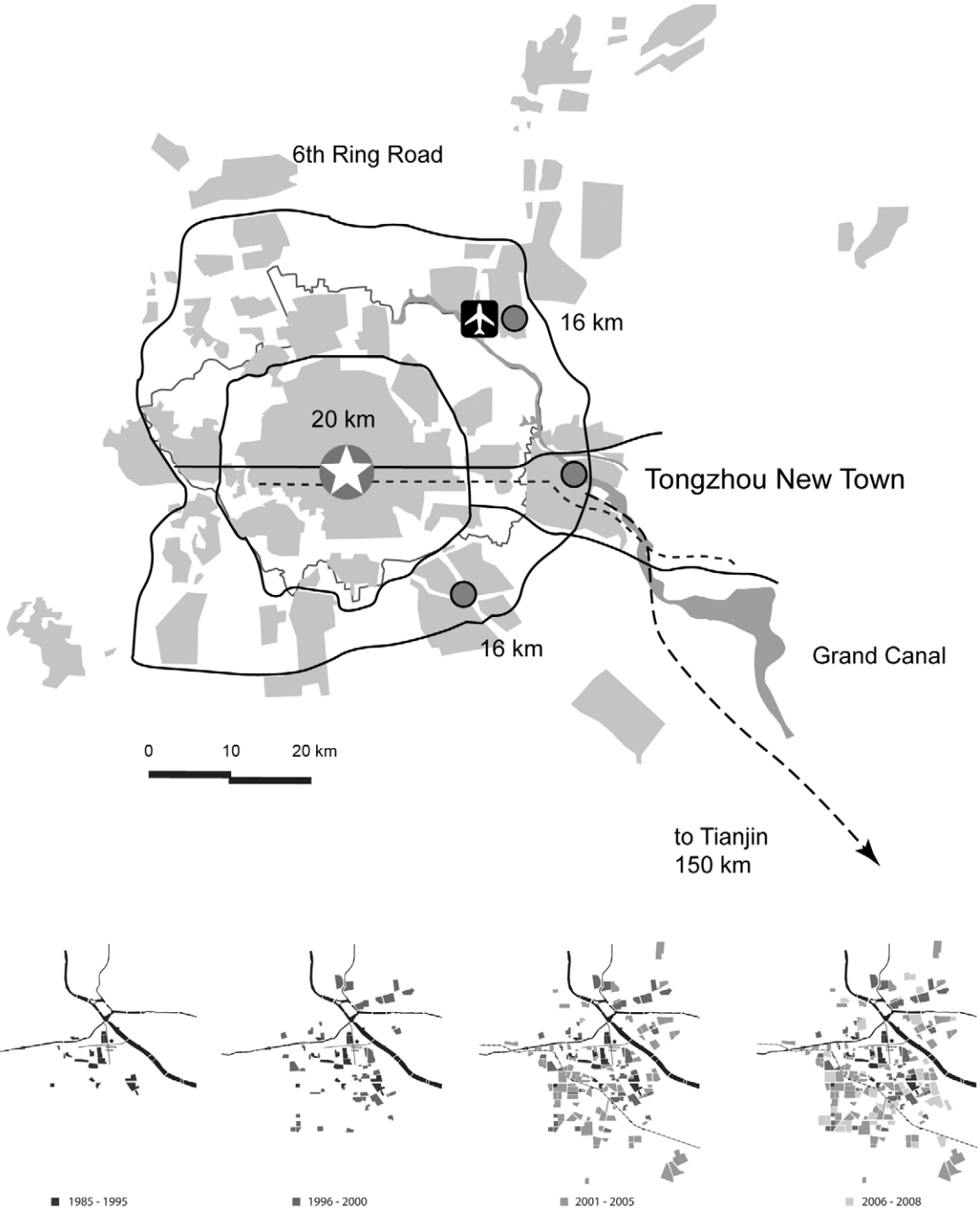


Fig. 7: Tongzhou: regional position. Source: illustrated by Jing Zhou based on Beijing city map.
Fig. 8: Tongzhou: Real Estate Development 2001-8. Source: illustrated by Jing Zhou, based on data from Tongzhou bureau of statistics.

urban areas, and the poorly-educated who concentrate in the old town.

Urban Economy and Employment

The ratio of primary, secondary and tertiary industries in Tongzhou District changed from 11:48:41 in 2003 to 6.5:50.6:42.9 in 2007.[14] Manufacturing industries remain the biggest sector. Having been an industrial town since the 1950s, a number of old factories are still scattered in the old urban area [fig. 13], which has a negative influence on the urban image.

Currently there are five newly-planned specialised industrial parks occupying a total area of 32 square kilometres (see note 11 above), which is the largest among all the suburban districts in Beijing. However, it is not as attractive as expected for the target competitive companies at this moment. The main occupations in the new town lie predominantly in the low-end sectors, i.e. manufacturing, building construction, retail and catering business, and social service. Therefore, not enough highly-skilled or well-educated employees are attracted to Tongzhou New Town. The total revenue from new industries is less than in other major suburban districts.[15]

In terms of daily life services, the new residential districts have become self-contained. Many big chain stores, supermarkets and a shopping mall have opened there. There are also plenty of small neighbourhood shops that make local streets lively. The existing main shopping street in the old town part has been moderately upgraded, serving the less wealthy locals. People living in different urban districts - new and old - do not have the necessity to go to other parts of the city for supplementary urban services. The revenue from the retail and wholesale sector in Tongzhou continues to grow, and is the highest among other suburban districts (see note 14 above). Still the quantity and quality of urban services cannot compare to that of the central city. Therefore people, especially the young white-collar, have to go to the central city for leisure activities.

Conclusions

Tongzhou, which used to be a famous historical town, has been developing very fast since around 2001. The new ambition drawn up in the new Beijing Master Plan 2004-20 is to transform it into a modern middle-size city with comprehensive urban functions. [fig.14] Currently the challenges are multi-faceted: (1) the local employment is to be enhanced, in order to guarantee the sustainability of urban economy, and to avoid it becoming a dormitory town; (2) the town needs to upgrade its social structure further; currently there is a large percentage of poorly-educated low-income people; (3) the spatial arrangement of new housing districts is homogenous and to some extent fragmented, therefore high quality cultural leisure services as well as public spaces should be well integrated; (4) the quality and image of the old town has much to be improved in order to coordinate with the new areas; the town lacks a central image, whether new or traditional. Dealing with these challenges requires creative spatial interventions and effective urban management.

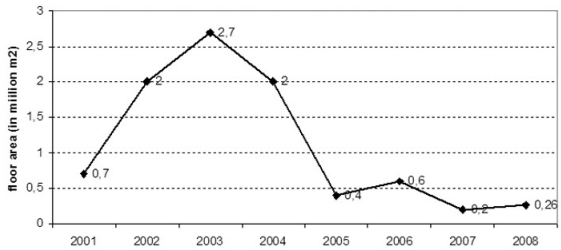
3. Comparison of the Two Cases

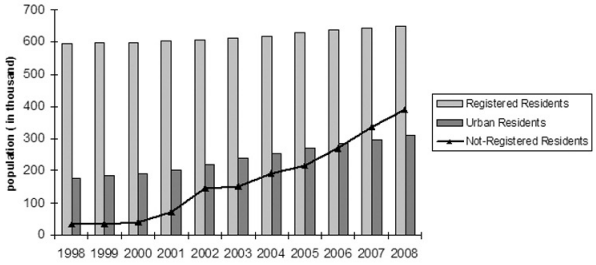
3. 1 Concise Comparison

In this section, a comparison between the two cases is summarised in a table, based on which critical analysis on the official plans and more concrete recommendations will be provided in the following paragraphs. [table 2]

3.2 Common Problems

Whether planned or market-driven, these two cases share the same problem of mono-functional development in the early phase - purely housing with insufficient public facilities. This was partly caused by inefficient urban management. Private developers became the biggest beneficiary in the projects; however, the profit has not contributed to subse-





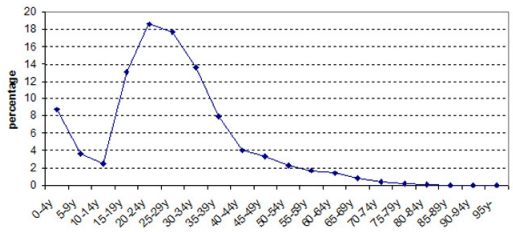


Fig. 9: Tongzhou: growing process of housing stocks 1985-2008. Source: illustrated by Jing Zhou.

Fig. 10: Tongzhou: typical neighbourhood model. Source: www. Soufun.com.

Fig. 11: Tongzhou: population growth 2001-28. Source: illustrated by Jing Zhou, based on data from Tongzhou bureau of statistics.

Fig. 12: Tongzhou: Age Composition of Not-Registered Residents in 2000. Source: illustrated by Jing Zhou, based on data from Tongzhou bureau of statistics.

	Tiantongyuan	Tongzhou New Town
Time Frame	1998 master plan 1999 started construction 2004 transformation program Nearly **finished** in 2007	1953 industrial town 1995 satellite town as in master plan 2001 started rapid development 2005 new town as in master plan 2008 **priority** after Olympics
Location	Near suburb in the north of metropolis 17 km from the centre of Beijing 8 km from National Olympic Park 12 km from University Cluster	Far suburb in the east of metropolis 20 km from the centre of Beijing 13 km from CBD area 16 km from Beijing Capital Int. Airport
Accessibility	1 main city artery Metro no. 5 since 2008 Light rail no. 13 since 2003 About 30 bus lines	3 main city arteries 1 highway connection Light rail Batong line since 2003 Intercity train connection About 30 bus lines
History	Start with a clean slate	Historical harbour town North End of the Grand Canal
Size	Planned total area: 8 km² Current built-up area: 8 km² Planned population: 0.3 million Current population: 0.15 million	Planned total area in 2020: 85 km² Current built-up area: 42 km² Planned population in 2020: 0.9 million Current population: 0.4 million
Planning & Development	**Planned** by Beijing municipality Developed by a private real estate company	Independent Tongzhou municipality **Free market-driven**
Housing Price	2001: 2650 Yuan / m² (controlled) 2008: 7600 Y / m² *2001 average of Beijing city: 4770 Y/m² *2008 average of Beijing city: 15,000 Y/m²	2001: 3200 Yuan / m² 2008: 6500 Y / m² * 2001 average of Beijing central district: 13,000 * 2008 average of Beijing central district: 25,000
Housing Typology	Middle, high-rise apartment building **High density**	Middle-rise apartment building; townhouse; villa **Middle-low density**[16]
Social Composition	Mainly **middle-low**, mixed with middle income groups High percentage of 'Separation of Registered and Actual Residence' **Safety problems**	**Diverse**, covering low, middle-low and middle income groups High percentage of 'Separation of Registered and Actual Residence' **Spatial segregation** between old and new
Public Facilities	Not well-considered in the beginning A **new centre** with comprehensive commercial, recreational, educational and medical services has been built since 2004	An existing main shopping street; **new centralities** developing around metro stations, but lack of a new **central image** Enough small daily business in the new neighbourhoods
Industry & Business	None Difficult to compete with new towns	biggest sector: low-end manufacturing growing **retail** business Aims to enhance diverse service business
Public Space	Spatial quality is being **improved** with new parks, more greenery, and better architectural design	Old urban area: several historical cultural places, but few visitors New urban area: good quality street greenery, but lack of large public spaces
Public Participation	Strong sense of community **Self-organised** society via local website[17] Collective request on improving public facilities and traffic conditions	More organised cultural activities by public sectors **Self-organised** social activities via active community website[18]
Urban Governance	Heavy burden for the municipality to re-invest in public facilities	Loose land control before 2005 New Town Master Plan Heavy burden of **urban renewal**

Table 2: Summary of Comparison.

quent public investment on facilities and services as it should. The burden of re-investment and maintenance has been left to the municipality again, for instance improving infrastructures, providing quality educational and medical services, public spaces etc.

3.3 Lessons from Case Studies

Building a self-sustained new town is the priority and biggest challenge for the urban development of Beijing in the coming two decades. Therefore it is essential that the Beijing municipality should learn valuable lessons from these two pilot projects, Tiantongyuan and Tongzhou, which represent two models of peripheral developments, and have crucial impact on the regional spatial structure.

Based on the comparative analysis above, lessons can be drawn from the two cases.

(1) The need for new models of project management.

Instead of commissioning a private real-estate developer or decentralise the responsibilities by loosely dividing them among various public sectors, a specialised non-profit development corporation should be established to play a leading role in such long-term urban projects.[19] Such a corporation could take charge of the public funding and subsidies from the municipality and cooperate with various public sectors. It could operate like a private developer, but with the priority to use the profits for re-investing in the public interest. As a result, it may help to realise long-term social objectives and reduce the negative effects driven by market forces. External monitoring by a third party should be guaranteed in this case so as to maintain transparency and openness for the public.

(2) Enhance the role of spatial planning for more effective urban management.

Such large-scale urban programs should have a feasible phasing plan that fits the long-term strategic planning of the metropolitan region in the first place. The case of Tiantongyuan demonstrates the failure of coordination in urban development on the city scale. Lacking sufficient traffic connections in the early stage, it was known by the nickname 'the trapped community' for a long time. In the case of Tongzhou, the problem is slightly different, and mainly related to land development. Although the master plans were updated every five to ten years before 2005, they were not strictly legally-bonded and focused too much on the macro scale, and they were not efficient in directing land development. The role of spatial planning should therefore be re-considered and more concrete and effective instruments for urban management should be researched and implemented, for example strategic planning, and a flexible 3D zoning plan.

(3) Spatial intervention as a tool for a better social composition.

The planning idea of a large-scale community or new town accommodating homogeneous middle-low income groups has been proven to be problematic. More well-educated middle-high income people or young professionals should be attracted to these areas. Besides mixing different housing typologies and providing sufficient public services, improving the quality of various public spaces has also proven to be an efficient spatial solution. A well-known reference could be Barcelona. The city used the strategy of regenerating various public spaces to successfully achieve the goal of lifting urban attractiveness.

(4) Increase residential mobility for vulnerable groups.[20]

Residential mobility should be considered an essential part of urban strategies towards sustainable development, since it has a crucial influence on the socio-spatial structure of the city.[21] The increase in residential mobility is mostly initiated by the changing of employment locations (labour mobility), which could be supported by an available and affordable housing stock near work places and vice versa.

Currently, the government is initiating revolutionary proposals on housing provision for low and middle-low income population, in order to reduce the severe influence of the free market on the affordability of vulnerable groups.

3.4 Specific Recommendations for the Cases

Tiantongyuan has reached a stable phase with a slow increase in new building and population. Urban transformation for better quality has been and will continue to be its aim. More efforts need to be made on two different levels: for the city scale, new infrastructures, urban functions, and public facilities are expected to improve the accessibility and urban vitality, which needs to rely on public interventions; for the local scale, more attention needs to be paid to the socio-cultural life in the community. Moreover, the improvement of the spatial quality of outdoor public spaces is still in demand, especially in dealing with the current safety problems. Interestingly, during the difficult early phase, there were already some forms of self-organised collective activities, which contributed to improving the social environment of the neighbourhood. This could also be institutionalised by creating a certain type of community committee that exclusively serves for organising local activities. Community life could also be improved by re-designing the space around the new metro station, which is absent in the current plan.

Tongzhou New Town is supposed to be one of the major growth poles for urbanisation and modernisation after the 2008 Beijing Olympic Games. It has a great opportunity to become a self-sustained modern town with a distinct identity. Our suggestions include: firstly, in order to reach a cohesive urban structure for the entire town, the physical connection between the old and new urban fabrics should be strengthened. This could be realised by designing a recognisable and integrated public-space network connecting the old and new parts. To avoid socio-spatial segregation, attention should be given to social housing in the new urban area, while inducing a positive gentrification of the old central area. Secondly, new centralities (dots) around metro stations are currently self-developed. They should be designed better and enhanced. Together with several existing neighbourhood shopping streets (lines), the city, especially the new urban areas, can form a very lively service mesh. Considering the large amount of urban commuters in the town, the centralities should be mix-used and provide 24-hour programs. It is also important to establish a clear central image of the new town in order to improve the sense of recognition. Thirdly, history and culture are comparative advantages for Tongzhou New Town. This potential should be explored better, for example by waterfront designs, or periodical cultural events. Interestingly, the biggest artists' villages in Beijing are concentrated in the rural area of Tongzhou (see note 7 above). This valuable resource could also be utilised, for example by inviting artists to cultural events or having them contribute to the public arts in the town.

4. Final Remarks

The rapid urbanisation process in the Beijing metropolitan region since the mid-1990s can be seen as the spatial product resulting from the joint forces of top-down planning and the free market. The main character of this trail-and-error phase is the rapid quantitative increase in housing in the periphery - residential regionalisation, but without a holistic and coordinated regional plan and efficient urban management approaches that can provide sufficient public facilities and balance regional socio-spatial structure.

We suggest that now is the time to start the second phase of regionalisation, which is to transform the role of existing satellite towns from peripheral units into self-sustained new centralities with diverse urban qualities that are complementary instead of highly dependent on the central city. This conclusion is in conformity with the general regional strategies

Fig. 13: Tongzhou: existing land-use. Source: modified by Jing Zhou, based on atlas of Tongzhou masterplan of 2005.

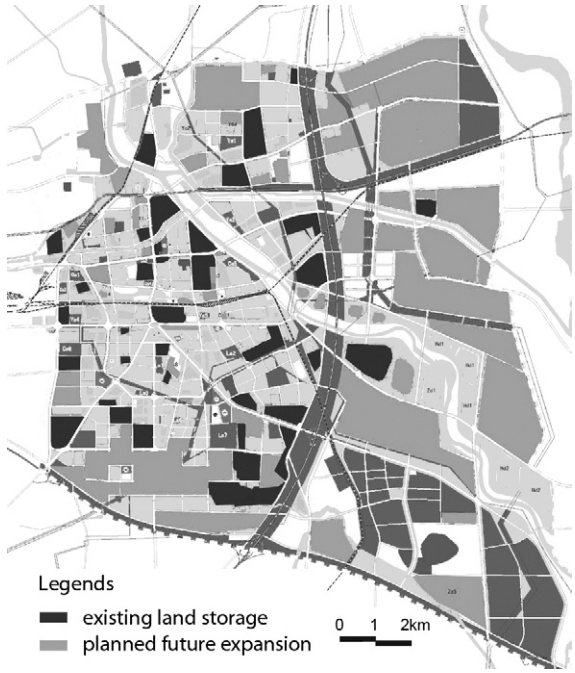


Fig. 14: Tongzhou: landuse plan for 2020. Source: modified by Jing Zhou, based on atlas of Tongzhou masterplan of 2005.

of the new master plan 2004-20, which emphasises the enhancement of the regional positions of peripheral developments - both near suburban clusters and far suburban new towns. However, the new master plan is just a starting point. It is a great opportunity but also a big challenge for the current satellite towns/clusters, because the success of the regional planning idea would largely depend on sound implementations from the bottom-up, as well as on the consistent support and supervision from the Beijing central government. Therefore, in this paper we have tried to provide some concrete spatial and managerial strategies as well as design recommendations for the two cases. Four important lessons have been drawn from the comparative analysis. We believe observations and suggestions from diverse points of view can serve as useful complements and references for local planning. The more complex the metropolitan form and internal factors grow, the more indispensable is the role planning and spatial research can play in getting a grip on the uncertainty and complexity.

Notes

1. Jing Zhou, 'From Monocentric to Multinuclear Spatial Model: An Analytic Study of Metropolitan Transformation of Beijing City 1949-2008', in *Conference Proceedings of Urban Project Conference*, ed. by Leen van Duin et al. (Amsterdam: IOS Press, 2009), pp. 392-99
2. Chaolin Gu & Jianafa Shen, 'Transformation of Urban Socio-Spatial Structure in Socialist Market Economies: the Case of Beijing', *Habitat International*, 27 (Amsterdam: ELSEVIER Press, 2003), pp. 107-22.
3. Beijing Municipal Commission of Urban Planning, *Beijing Master Plan 2004-2040*, May 17th, 2005, < http://www.bjghw.gov.cn/ztgh/> [accessed 30 April 2009].
4. Lei Qu, 'Socio-economic Forces Behind Sprawl and Compactness in Beijing', *ENHR International Conference 'Sustainable Urban Areas'*, 2007, <http://www.enhr2007rotterdam.nl/documents/W19_paper_Qu.pdf>. Lei Qu, 'Compactness and Mobility of the Beijing Metropolitan Area: seeking a sustainable urban form', in *Conference Proceedings of the Permacity International Conference*, ed. by Jürgen Rosemann (Delft: Delft University Press, 2007), pp. 129-33.
5. Instead of starting from scratch, the term 'new town' in the Beijing Master Plan of 2004-20 refers to existing satellite towns that will be modernised and upgraded. Therefore in this context 'New' means 'Renewed'. There are in total eleven new towns in the master plan, and only three of them are defined as major developing poles.
6. Yang Liu, 'Planning Design of the Core Area of Tiantongyuan Residential Quarter', *Architectural Creation*, 2006, 2 (Beijing: Beijing Institute of Architectural Design Press, 2006), pp. 129-31.
7. Limin Zhan, 'How to Make a New Characteristic Tongzhou', *Invest Beijing*, 2007, 12 (Beijing: Beijing Develop and Reform Commission Press, 2007), pp. 41-43.
8. 'the History of Urban Planning and Development of Tongzhou District' (unpublished research report, Beijing Tongzhou Planning Bureau, 2003)
9. The new housing projects in Tongzhou developed during 1990s were emerging in a self-organised way, i.e. firstly chaotic but forming a degree of internal logic afterwards. The projects popped up here and there like patches. Early developers cared little about integration with urban structure. City planning during that period was often to adjust passively to the informal developments, e.g. making up for infrastructure and facility shortage. However, the later projects tend to coordinate with existing urban fabric, e.g. forming neighbourhood shopping streets and aggregation of similar quality (price arranged) neighbourhoods.
10. Yan Xu & Wenhua Li, 'Analysis of the Structure and Development of Market Housing in Tongzhou', *Beijing Real Estate*, 2007, 8 (Beijing: Beijing Real Estate Press, 2007), pp. 73-75.
11. Qi Xiao, 'From "Sleeping Town" to "Business Town": the new issues of planning nine business parks in Beijing Tongzhou', *Beijing Real Estate*, 2007, 9 (Beijing: Beijing Real Estate Press, 2007), pp. 4-11.

12. Tongzhou Planning Bureau, *Tongzhou New Town Master Plan 2005-2020*, February 18th, 2006, < http://www.weilai.gov.cn/xcgh.asp> [accessed 30 April 2009].
13. 'Research Report on the Subject of Social and Cultural Development of Tongzhou New Town' (unpublished research report, China Academy of Urban Planning and Design, 2004)
14. Yongming Zhang, 'Promoting Socio-Economic Development of Tongzhou in Post-Olympic Period', *Journal of Beijing Agricultural Vocation College*, 23, 1 (Beijing: Beijing Agricultural Vocation College Press, 2009), pp. 52-55.
15. 'Tongzhou New Town Master Plan 2005-2020' (unpublished digital presentation, Tongzhou Planning Bureau; Beijing Municipal Commission of Urban Planning and China Academy of Urban Planning and Design, 2005)
16. The difference in neighbourhood typology between Tongzhou and Tiantongyuan just reflects the different ways of housing development – market-driven and government-planned. As explained, housing in Tiantongyuan is subsidised to be affordable for the middle-low income group. The higher compactness is considered to have a higher economic and social efficiency. In Tongzhou, developers have to attract middle-low income people from the central city by using lower density and better housing typology as selling points. Moreover, Tongzhou as a new far town has more available land at a lower price, which makes middle-low density development possible.
17. Tiantongyuan community website: < http://www.tty.com.cn>
18. Tongzhou community website: < http://www.batong.cn/>
19. One of the references for a project-management model could be the Dutch Housing Cooperation, which is a semi-public organisation operating like a company but serving social responsibility. In some new Chinese towns, a program-based New Town company is formed to coordinate various public and private sectors.
20. There are different definitions for 'vulnerable groups' in different contexts, discussed by Edward D. Hulsbergen, 'Don't forget to Measure Down Town', in *Conference Proceedings of the Permacity International Conference*, ed. by Jürgen Rosemann (Delft: Delft University Press, 2007), pp. 59-65. According to the *Government Work Report for the 16th People's Congress 2002* of China, it refers to people who, for any possible reason, are in a relatively disadvantaged situation in a society for a certain period or in a specific aspect. In this paper it refers especially to people with an economic disadvantage, that is low and middle-low income groups, whose annual family-income is under 10,000 Yuan and 60,000 Yuan respectively.
21. Ana Sugranyes, 'Mobility in the Low-cost Housing Stock: New Housing Supply for the Poorest Sectors in Santiago, Chile', in *Globalization, Urban Form & Governance, Fifth International Conference Alfa-Ibis Proceedings*, ed. by Marisa Carmona, Jürgen Rosemann and Marinda Schoonraad (Delft: Delft University Press, 2001), pp. 329-35.

Biographies

Jing Zhou received bachelor education in architecture and urban planning in Tianjin University in China. In 2004 she came to the Netherlands to pursuit master degree in urbanism from Delft University of Technology. After graduating as Cum Laude, she continues with Ph.D. research in Delft on the subject of comparative study of Chinese and Western new towns. She is also a researcher for International New Town Institute (INTI) in Almere.

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Polycentric Metropolitan Form: Application of a 'Northern' Concept in Latin America

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1. Introduction

Until the early 1980s, the monocentric model was the standard approach to study the spatial structure of cities in countries of advanced economies. This model 'postulated a concentration of employment in the central business district (CBD) with the rest of the metropolitan area devoted to residential use'.[1] But not all employment was concentrated in the CBD: manufacturing was generally located outside it, in areas with lower densities and land values.[2] Gradually, more employment started to move outside the CBD, following and anticipating residential suburbanisation. After 1950, 'Fordism simultaneously accentuated centrality, with the concentration of financial, government, and corporate headquarters in and around the downtown core; and accelerated decentralization, primarily through the suburbanization of the bourgeoning middle class, manufacturing jobs and the sprawling infrastructure of mass consumption that was required to maintain a suburban mode of life'.[3]

Since the 1980s, however, we see a more fundamental change. The city centre ceased to be the single focal point for productive activities and jobs. Metropolitan areas have stretched out into discontinuous, borderless and centreless urban forms with a growing number of economic subcentres. These subcentres have functional interrelations with the city centre and other urban nodes located in the same city and in other cities, at national or international level.

These trends made clear that the monocentric CBD-dominated city was no longer valid. The polycentric model emerged - and gained popularity - to denote the new spatial reality of metropolitan areas. The concept of polycentricity, however, does not have a clear and undisputed meaning. On the contrary: to paraphrase Davoudi, the concept has now different meanings for different people with regard to different urban configurations at different geographical scales.[4] These different configurations correspond with different manners of spatial development of polycentric urban systems: the centrifugal, the incorporation and the fusion mode.[5]

Due to the spatial origins of their urban systems - a number of small and medium-sized cities at close proximity - European studies pay attention to 'polynucleated metropolitan regions' and 'polycentric urban regions' that have evolved by an incorporation or fusion mode.[6] On the other hand, United States' literature generally addresses a centrifugal mode[5] of outward expansion of single metropolitan areas with new subcentres of employment.

A variety of forms and sizes of employment clusters in subcentres have been observed in the U.S. Some even 'look remarkably similar to a traditional CBD, with thousands of workers employed in a wide variety of industries'.[7] The CBD may still be the largest employment cluster, but decentralisation has had significant effects on its overall spatial distribution across the metropolitan area.

Further, the discourse in North America observes, often in 'abstractions of postmodernism',[8] a changing 'big picture' of metropolitan areas within the context of the globalising post-industrial economy. An evermore expanding patchwork-type of spatial distribution of economic subcentres is being emphasised, connected with their increasing functional diversity and diverging geographical patterns of functional interrelations.

Several scholars have suggested that metropolises of the developing world also show trends towards polycentricity.[9] Some of them commented on emerging subcentres in large metropolitan areas in Latin America. Harris e.g. already mapped 'the subcentres' of Caracas, Lima, Sao Paulo and Buenos Aires. In his 'model of the Latin American city', Bähr distinguished a few subcentres, a phenomenon which became almost generally accepted as of the 1980s.[10] But these subcentres were generally mentioned in descriptive terms, without clear definitions, and hardly operationalised in quantitative terms (as it eventually happened in North America). Their (spatial) evolution was neither systematically tracked through time and/or placed in comparative perspectives.

This paper attempts to broaden our knowledge on the concept of polycentricity by exploring the dynamics of subcentre formation in large metropolitan areas in Latin America according to the spatial distribution of employment. It focuses on large metropolitan areas, for, if sizeable subcentres of employment have developed in Latin America, they are expected to occur there. In essence, this contribution reviews the international and local literature on the (Latin American) polycentricity debate related to issues of the metropolitan form and its transformation through time, but not from the perspective of planning or governance.

In the absence of explicit criteria to answer the main questions, an indirect methodology will be used, consisting of three steps. The first starts with a brief historical review of polycentricity in North America, resulting in a few key-elements that typify the polycentric development of its metropolitan areas. In the second step, the paper gives a bird's-eye view of the debate on possible subcentre formation in large metropolitan areas of Latin America. Since the local literature on polycentricity is mostly of a qualitative and descriptive nature, this part finishes by presenting the results of a breakthrough study of the metropolitan area of Mexico City (*Area Metropolitana de la Ciudad de México* or AMCM) by Aguilar and Alvarado,[11] assuming that similar types of spatial development may also be encountered in other large metropolises of the region. In the last step we present the findings and recommend some elements for a research agenda on polycentricity in metropolitan areas of Latin-America.

2. From monocentric cities to polycentric metropolitan areas in North America: a brief historical review

U.S. studies on urban polycentricity date back to the beginning of the 20th century. In 1937 Proudfoot observed the existence of nucleated business districts outside the CBDs of larger American cities that were bound to intra-urban highway intersections.[12] Evidence of multiple peaks in land value functions in the early 20th century brought McMillen to comment that 'the assumption of monocentricity was *always* [our italics] more of a mathematical convenience than an accurate depiction of reality'.[13] Three decades later, the 'circus tent' by Berry also dealt with the intra-city level.[14] Already at that time however, some consumer-oriented services had started to decentralise to locations outside central cities, following - or anticipating - residential suburbanisation: 'communication agencies, financial and legal services, the administrative offices of political, recreational, religious and other services as well as industry concentrated in subcentres in metropolitan areas'.[15] Schnore distinguished already in the late 1950s between 'housing or dormitory suburbs and

manufacturing or industrial suburbs'.[16]

In the 1950s, however, most urban employment was still - and by far - concentrated in and around CBDs. '[T]he typical American city' at that time 'still had a high density core where most people worked', with 'a majority of these workers actually living in suburbs and commuting by car'.[17] Atkinson used the metaphor of the hub-and-spoke metropolis to represent this predominant commuting flow from different 'bedroom suburbs' towards the single urban core.[18] In the 1960s, jobs started to follow the ever-larger share of metropolitan residents that suburbanised on a bigger scale; the 'second wave of suburbanisation'.[19]

The role of centrality - i.e. proximity to consumers and workers as well as to business and service providers - as an explanation for the concentration of productive activities and their jobs in the CBD greatly diminished after 1960. Manufacturing plants were among the first to relocate, followed by retail, professional consumer services (e.g. doctors, lawyers, schools etc.) and business services.[20] Calculations by Gordon et al. of private sector growth rates in fourteen of the largest US metropolitan areas over the time span 1969-1994 show that these rates were by far the lowest in their central counties and much higher in surrounding rings of adjacent counties.[21]

These relocation trends, and the consequent change of the spatial distribution of employment, are usually explained by the dichotomies of (1) economies versus diseconomies of agglomeration and (2) decentralisation versus clustering. Decentralisation, i.e. the moving out of firms and jobs from the CBD of central cities, accelerated because increasing diseconomies - rising land and congestion costs, fiscal instability, and social and physical decline - started to undo the advantages of clustering in the CBD.

The car, and later information and communication technologies (ICTs), have lowered transport and communication costs and facilitated distant locations. Nevertheless, accessibility for employees, suppliers and customers remains a valid consideration in firms' location decisions. This has resulted in polycentric structures insofar these decisions have taken place in concert with clustering in new subcentres.[22] Subcentres as building blocks of polycentric structures have particularly emerged at intersections of the expanding automobile system across suburban zones.

After three decades of job decentralisation, the North American downtown, including its CBD, has lost its status of the single centre of gravity of metropolitan employment, which has shifted away to new subcentres. Employment in the subcentres is almost without exception larger than CBD employment. Based on data of the Economic Census 1982, Gleaser et al. classified the 100 largest U.S. metropolitan areas into four types according to the spatial distribution of employment. The outward shift of the metropolitan employment balance is most clear in the decentralised and extremely decentralised types [table 1]. On the other hand however, 31 of these 100 metropolitan areas still belonged to the dense type with a concentration of minimally 25% of employment in the 3-mile radius around the heart of the CBD.[23] Possibly, the CBD is still the single largest cluster of employment in these metropolitan areas.

More recently, downtowns have experienced a remarkable process of revitalisation due to the growth of new key-sectors. These include both command and control functions in operational headquarters of transnational corporations and small-scale firms in creative industries, both to meet their need for face-to-face communication. Furthermore, downtowns are being transformed to places of consumption of culture, leisure and entertainment industries.[24] These new functions are much

less prevalent in peripheral subcentres. Hence, the metaphor of the 'donut city', i.e. 'a city with an empty centre drained by parasitical new subcentres',[25] is not any more valid for U.S. metropolitan areas.

Some authors emphasise that this changing metropolitan organisation of employment is more fundamental than just a changing spatial balance of employment.[26] According to Soja, North American suburbia has transformed into ' a seemingly new form, […] arising from a process involving the urbanisation of the suburbs'.[27] The 'flight' from the city centre is no longer the primary source of employment in suburbs; this centre is no longer the exclusive 'point of first entry' for firms to a metropolitan system.[28]

Polycentric development in North America has evidently taken a great part of the twentieth century, from which we can distinguish three stages:
- A gradual but slow evolution in the first half of the past century;
- An accelerated evolution during the three post-war decades; and
- A transformation towards 'a post-industrial form of urban agglomeration since the end of the 1970s.[29]

In this last stage, we see a more fundamental change of the polycentric form and organisation of metropolitan areas due to several processes, including the ever-expanding suburbanisation, car-dependency, the expanding road system, the widespread use of ICTs, and the emergence of the global service economy and consumer society. In the following section, the morphological and functional dimensions of current polycentric development of North America metropolitan areas are typified by four key characteristics.

3. Key elements of North American polycentric development

3.1 The number of subcentres increases, spreading out over larger territories

U.S. literature on polycentric development does not cast any doubt on the foundation and growth of subcentres of employment. But there is no standard methodology to identify subcentres. Interesting work on formal quantitative procedures is being done,[30] but it is nevertheless the early, and relatively little sophisticated model of Giuliano and Small[31] that has been repeatedly applied in comparative research,[32] and is therefore useful to observe the evolution of subcentres. This model defines employment centres by a minimum of 10,000 jobs and a minimum density of 5,000 jobs per square mile.

Making a minor adjustment - a minimum density of 15 employees per acre - McMillen identified the subcentres in Chicago's metropolitan area: 9 in 1970, 13 in 1980, 15 in 1990 and 32 in 2000. Data from 1990 in 62 U.S. metropolitan areas showed that the number of subcentres rises with metropolitan areas' population size.[33]

The new subcentres have been established further away from their traditional downtowns. 'The Interstate System has enabled metropolitan regions to sprawl to a radius to […] even 60 miles across'.[34] In the early 1990s it was already observed that U.S. metropolitan areas had extended over territories as large as the '100-mile city' or the '100-mile corridor'.[35] This extension is not primarily a matter of 'more centres need more space', which theoretically would have resulted in an extending but still rather compact landscape of continuous medium- to high-density subcentres of employment. Instead, the big picture is a patchwork of subcentres located at nodal points of high bid-rent values, interspersed with open land and residential suburbs with low built-up densities, and interconnected by extending networks of freeways and beltways.

3.2 Subcentre development reflects the rise of the service economy

The development of large concentrations of corporate office complexes in edge cities is generally related to the emergence of the U.S. as a service economy.[36] This general trend has changed the composition of employment in subcentres of North American metropolitan areas.[37] According to Frey, 'nonmanufacturing jobs have suburbanized faster than manufacturing jobs already since about 1970'.[38] These latter jobs had already suburbanised, or had started to move to 'other parts of the world that offered more malleable environments and lower costs'.[39]

The development of subcentres towards clusters of services has rarely been tested with quantitative data, however. A notable exception is McMillen's study, whose data show, for 1980, that the 'single largest' shares of jobs were manufacturing in eight subcentres, 'services' in four subcentres, and 'transport, communications and utilities' (TCU) in the remaining three subcentres.[40] The picture had slightly changed in 1990: manufacturing was the largest single employer in seven, services in six and TCU in two subcentres. In 2000 however, the picture had more drastically changed in the direction of a growing importance of the service economy. Manufacturing was still the single largest employer in only five subcentres. Services, on the other hand, was the largest one in twelve subcentres, and if we include retail and FIRE industries even in seventeen. In the remaining ten subcentres, TCU (6) and government (4) were the largest employers.

3.3 Subcentres have grown bigger and more autonomous vis-à-vis the CBD

The deconcentration of employment in the first half of the past century was limited in size and generally created small clusters. Most workers still had a job in or near the central business district, which was still 'a large nucleus and the rest of the employment centres small and dependent satellites'.[41] The transformation of urban agglomerations since the early 1980s has changed the employment balance of metropolitan areas from the CBD to subcentres that are no longer small and dependent.

Garreau emphasised subcentre development around the most visible landmarks of the metropolitan areas: shopping mall and office-centres. His Edge Cities were defined by minimum quantities of 0.6 million square feet of retail and five million square feet of office space.[42] McKee and McKee argue that the office component is far more significant than retail in Edge Cities because it represents growing concentrations of corporate offices and research facilities that are components of production chains of major corporations which operate in many nations.[43]

A major explanation of the increasing size of subcentres of employment is the addition of evermore new economic activities and specialisations, tied to markets and production chains outside their metropolitan areas, to services and production for the local market. Bogart and Ferry, and Anderson and Bogart explain the specialisations of subcentres in terms of exports to national or international markets.[44]

Contemporary subcentres develop indeed more autonomously from central cities than a few decades ago, but their corporate offices are still part of 'metropolitan business complexes': they 'export' to the CBD and other subcentres in their metropolitan area and require access to both their suburban labour supply and to the advanced business services in their CBD.

Despite these common elements, the 'big picture' of polycentricity across the U.S. includes considerable differences between cities. Based on data of decentralisation *cum* concentration in subcentres - of 1980, 1990 and 2000 - Lee distinguished three

types of metropolitan areas:

(1) Those with great decentralisation and low concentration (Philadelphia and Portland);
(2) Where a significant proportion of decentralising jobs has reconcentrated in suburban centres (Los Angeles and San Francisco); and
(3) Where urban cores (still) perform better than suburban centres and have remained strong employment agglomerations (Boston and New York).

Type 2 represents the most polycentric metropolitan areas. The other two types are less polycentric, but fundamentally different. Type 1 shows a much more dispersed spatial organisation of employment and type 3 has progressed less than type 2 in the shift from monocentric to polycentric.[45]

The following question is whether these key-elements are also visible in metropolitan Latin America. Do we find similar phenomena in the Latin American metropolitan structures? Does Latin American polycentricity - if developing anyway - differ from the North American in its spatial and temporal manifestations, and to what extent? To answer these questions we continue with step two of our methodology.

4. Metropolitan Latin America: a different socio-economic context

Between 1950 and 2000 Latin America's urbanisation rate jumped from about 40 percent to over 70 percent, while the number of cities with more than a million inhabitants went up from seven in the early 1950s to almost fifty in 2000. At the beginning of this century, Mexico City, Sao Paulo, Buenos Aires and Rio de Janeiro amply exceeded the ten million mark.[46] Latin America's urbanisation process is clearly linked to economic and demographic processes since the end of the 19th century, in which immigration and internal migration played a very important role.[47] During the 1950s, rural-urban migration still accounted for some 50 percent of urban growth. Despite a gradual decrease over time, these rural-urban population transferences still made up for more than 35 percent of Latin American's urban growth during 1990-2000, despite huge country-to-country variations.[48] Besides, the decrease of the rural-urban transferences to the metropolitan areas was (more than) compensated by increases in urban-urban transferences, i.e. from small and medium-sized towns to large metropolises.

Ongoing rural-urban migration in Latin America goes together with growing urban poverty. The continuous increase of the labour force outpaces job-growth in the formal economy. Large segments of the low-income groups find alternatives outside the regulated market, through self-employment. This has resulted in the dramatic growth of the informal economy, currently a salient element of Latin America's metropolitan structures. This is characterised by a network of small- and micro-scale oriented, unregulated and unprotected production, repair and service activities, which yield low and unstable incomes. The proportion of informal economic activities in urban employment roughly varies from a relatively low 30 percent in Chile to 60 percent in Peru.[49]

The population distribution in metropolitan areas has experienced large movements, generally from the centres to the peripheries, which now also accommodate gated communities, housing projects for the middle classes and social-housing projects for lower-income groups. These peripheries, once almost paramount areas of self-help housing, are increasingly 'mixing' with other residential developments. As a result, the polarised city with its clear-cut spatial differentiation between the rich (city centre) and poor (urban periphery) is gradually turning into the fragmented city with complex patchworks of highly different socio-economic groups living apart together.[50]

Metropolitan Area	Total employment within 35 miles from CBD	Type of Metropolitan Area	Shares of metropolitan employment within zones around heart of CBD		
			< 3 miles	3 – 10 miles	10 – 35 miles
LosAngeles – Long Beach	3,229,154	Extremely decentralised	6.9	31.2	61.9
New York	3,078,507	Dense	45.3	32.1	22.6
Chicago	2,814,162	Decentralised	18.7	17.7	63.6
Philadelphia	1,869,688	Decentralised	16.6	23.8	59.6
Detroit	1,604, 527	Extremely decentralised	5.2	16.7	78.1
Boston	1,536,970	Dense	25.7	29.4	44.9
Washington DC	1,515,563	Decentralised	18.9	33.8	47.3
Atlanta,	1,457,958	Decentralised	11.3	26.8	61.9
Houston,	1,419,485	Decentralised	12.0	37.7	50.3
Dallas,	1,399,951	Decentralised	11.4	30.7	57.9

Table 1: The spatial distribution of employment in the 10 largest North American metropolises according to size of employment (Source: Glaeser *et al*. (2001))

Important segments of economic activities and employment have also moved outwards.[51] Clusters of economic activities have emerged outside the central areas, oriented to highly different population groups.[52] Shopping malls have been built for the higher-income groups, while 'traditional' open-air markets came about for the lower-income groups. Industrial estates sprang up on new manufacturing locations in the outskirts, while clusters of informal production- and repair-units appeared elsewhere. In such way, the formal and informal activities of the city-centres were 'replicated' in the expanding peripheries.

All these changes produced an increasing demand for transportation. Private car ownership and its associated auto-mobility - which in the U.S. have strongly determined the formation of subcentres of employment - have also increased impressively over the past years in Latin America. Nevertheless, both are still much smaller in size because only a small proportion of the population can afford car ownership. Hence, most people use collective systems for their (daily) mobility: suburban railways, subways, large and small buses, taxis etc. In Mexico City, approximately 80% of the 30 million daily trips in 2000 was performed by collective transportation modes, with private cars (including taxis) making up for the remaining 20%[53]. In Lima, 77.3% of the 12.1 million daily trips was made using public transportation in 2004; 7.4% by taxi and 15.3% by private cars.[54]

Based on all these recent types of changes in the spatial metropolitan structure in Greater Buenos Aires, Janoschka proposed a new model for the Latin American city [fig. 1], which illustrates the notion of fragmented city that prevails in Latin American urban studies.

At first glance, Janoschka's model suggests some degree of polycentricity of Latin American metropolitan areas. However, the purpose of the model was more to show the heterogeneity and territorial extension of the new developments than the very formation of subcentres. Neither did it concern questions such as to what degree or why that may have resulted in polycentric developments. In the next section we will attempt to tackle those issues, using data from a study on Metropolitan Mexico City.

5. Subcentres in metropolitan Latin America?

The literature on the changing structures of Latin American cities has grown impressively.[55] In addition to the concentration of economic activities in their CBDs, the (largest) Latin American cities boasted outlying economic subcentres in the early 1970s.[56] Consequently, polycentricity-related ideas began to surface in the local urban literature. Nevertheless, a proper, comparative discourse on metropolitan subcentre formation and the emergence of polycentric structures in metropolitan Latin America is still in its infancy. The literature generally links up the emergence of subcentres in metro Latin America with a) the (spatial) expansion of the metropolitan areas, b) the dynamics of metropolitan populations and their spatial outcomes, and c) the changes that took place in manufacturing, commerce and services. Building on the observations of section 4, it is useful to add a few words about the spatial developments of the latter activity-groups.

Manufacturing. Although several metropolises had some industries in the late 19th century, manufacturing growth is mainly associated with the import-substituting industrialisation policies launched from the 1930s onwards. Consequently, industrial activities were seldom located in or near the city centres, but fanned outwards from the edge of the inner cities, following the road or rail arteries.[57] As of the late 1950s, industrial clusters were created in the expanding metropolitan fringes. Later, promoted by neo-liberal trends, newer industrial parks developed even further out, also as Export Processing Zones,[58] leading to the conceptualisation of 'industrial subcentres' in Latin America's

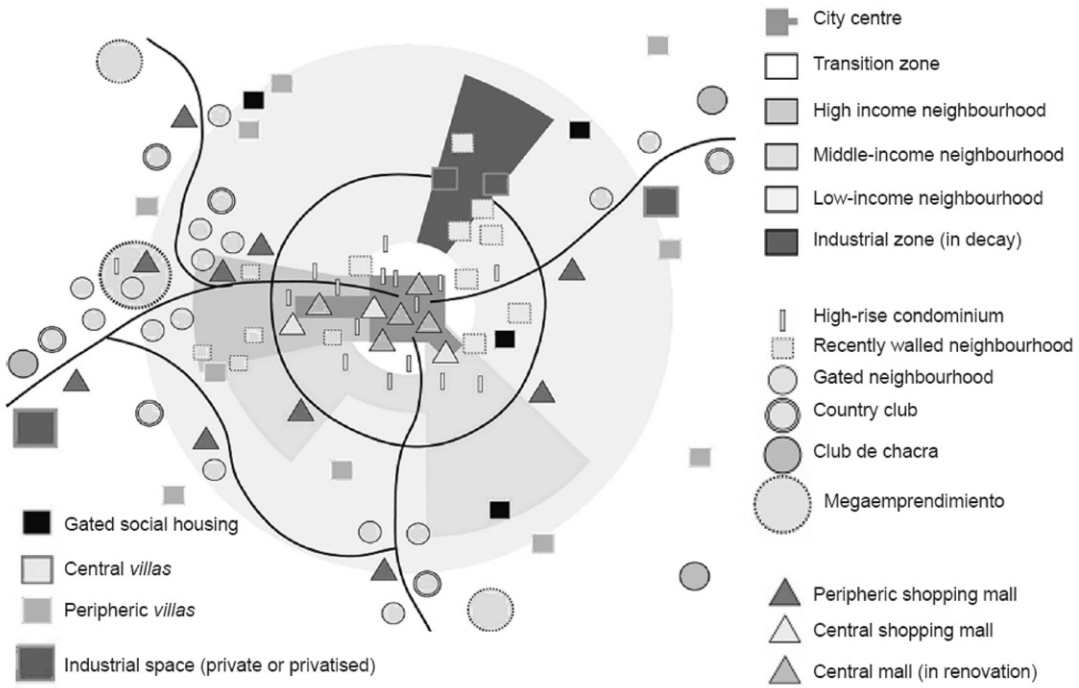

Fig. 1: Janoschka's model of the Latin American city.

metropolitan areas.[59]

On the other hand, large numbers of small and often informally organised manufacturing and repair activities emerged in the poorer areas of the metropolis. They were generally fairly ubiquitous and neighbourhood-based, but some of them were also organised in (sizeable) clustered forms, in spaces in and around the (covered) market-areas.

Retail-trade. For a very long time retailing activities were tied to the inner-city areas, which between the 1930s and 1950s also became the strongholds for convenience stores, shopping centres, large department stores, etc. Gradually, the outward expansions of the metropolitan populations were followed by the retail sector.[60] Tied to the purchasing power (and automobilisation) of the upper and middle classes, super- and hypermarkets, shopping-malls etc. appeared in the expanding peripheries, often with clear clusters near major transport arteries.[61]

Today, the modern retail sector is rapidly expanding in the outskirts of many Latin American metropolises, combined with leisure and entertainment facilities or/and with office and residential complexes.[62] Commercial and service apparatuses have also grown impressively in self-help housing districts at the peripheries. Apart from the almost ubiquitous small, neighbourhood-based shops, large and small supermarkets, convenience and specialty stores have entered the scene.

Under the current socio-economic conditions both the formal *and* the informal segments of the retail sector are rapidly growing.[63] The 'formal' retail clusters are strongly oriented toward the groups with higher purchasing power levels *and* largely depending on private automobility. On their turn, the 'informal' retail clusters are geared to those with little purchasing power, have a neighbourhood-based orientation and are dependent on public transport.

Other (office-based) services. The central areas of Latin America's metropolises were (and still are) important locations for government functions, the headquarters of para-statals and foreign enterprises, as well as offices of professionals and practitioners (like e.g. medical doctors, dentists, lawyers, notaries, real-estate agents, surveyors, underwriters, or travel agents). Many of these activities were located in the historic centres, but eventually they expanded to the adjacent - and frequently better accessible - zones along the major arteries.

Many services would later 'follow' the decentralising metropolitan populations into the expanding peripheries. By the 1970s, fair concentrations of service-oriented activities had emerged on the metropolitan fringes, catering to the various income groups.[64]

The growth of the public and the (national and foreign) private sector boosted a demand for medium- and large-size offices spaces in the metropolitan areas. Multi-storey office blocks were developed in the inner-cities, generally outside the historic centres, along major roads, alternating with international hotel chains, luxurious apartment towers and shopping complexes. Eventually, this resulted in the emergence of 'central spines': linear-shaped, medium- to high-rise commercial and residential corridors.[65] Typical examples of such spines are the well-known *Paseo de la Reforma* and *Avenida Insurgentes* in Mexico City and *Avenida Paulista and Avenida Faria Lima* in Sao Paulo.

The continuing demand for office space made the spines too expensive and problematical for automobile-access. This triggered the development of new high-rise office complexes further away from the metropolitan centres, located near major highways (to ensure accessibility by car) or/and close to metro stations or important bus nodes (to enable workers to commute by public transportation). Over time, such complexes even merged with residential,

shopping, entertainment and office functions, which also came into being in the context of metropolitan redevelopment plans. The medium height skyscrapers of the Santa Fe Area, located to the west of the core of Mexico City, and Vila Olímpia at the South West of São Paulo are interesting examples of this trend.

Over time, manufacturing-, shopping- and or office-based subcentres emerged away from the metropolitan cores, which in due course became quite conspicuous elements of the Latin American spatial structures.[66] Remarkably though, the discussion on subcentres and polycentricity on metropolitan areas of Latin America has a rather descriptive nature, while it generally lacks empirically-based quantifications. Moreover, the debate was (still is) hardly related to the changing economic structures of Latin American metropolises.

6. Subcentres and polycentricity in metropolitan Mexico City

Aguilar and Alvarado's recent study of Mexico City is one of the few in which the formation of subcentres is supported with empirical (census-)evidence.[67] This study processed a set of metropolitan-wide data from the Mexican 1999 Economic Census, broken down to the so-called AGEB-level (*Areas Geo-Económicas Básicas*). AGEBs are small statistical units similar to the U.S. census tracts.

The Mexico City Metropolitan Area (AMCM) as depicted in Figure 2 consists of 16 administrative divisions (*Delegaciones*) of the Federal District (DF); 24 adjacent municipalities of the State of Mexico (*Municipios Conurbados*), and 17 municipalities of the State of Mexico located further away (*Municipios Periféricos*). Applying a minimum of 5,000 localised jobs as cut-off point, the authors identified 35 subcentres in this very large area. Most of these subcentres are located in or near the core of the metropolis, in the northern *delegaciones* of DF. When we apply Aguilar and Alvarado's data to the distance categories of Glaeser et al. (see table 1), it appears that almost 70 percent of AMCM's employment is located in the first and second rings. In Glaeser's terminology, AMCM would be labelled a Dense Employment Metro. Outside these rings, the number of subcentres is rapidly diminishing in importance. While AMCM's employment structure is indeed clearly polycentric, the metropolitan core still plays a very important role. Using Lee's typology (2007), AMCM might be considered a Type 3 metropolis in which the urban core has the upper hand over the subcentres.

Breaking down the employment-data according to major economic sectors, it turned out that manufacturing was the single largest employer in 5 of the 35 subcentres. Unlike U.S. metropolises, manufacturing employment is not yet on the decline in Latin America where the post-industrial economy is only in its infancy. Figure 3 shows that manufacturing subcentres are still very much present within AMCM's core area. Nevertheless, manufacturing had begun to move outwards, in the late 1960s, into the adjacent areas of the State of Mexico, by accommodating relocations from the core and foreign newcomers.[68]

Figure 2 presents a picture at a given moment in time. Aguilar and Alvarado also tried to portray changes over time by comparing, as good as it gets, AMCM's Economic Census data of 1999 and 1989. Cutting through the hedges, the authors argue that the number of subcentres has grown. For 1999, they identified 10 (relatively small) subcentres more than for 1989. Although the urban core still has the upper hand over the subcentres in 1999, most of the new subcentres in the preceding decade had sprung up away from that core, in the outer 'Gleaserian' ring. Hence, apart from a clear-cut growth in numbers, AMCM's subcentres were also spreading out over a larger territory over time. These observations comply with one of the trends mentioned in section 3.

This model cannot be considered as a generalisable model for the process of subcentre formation in metropolitan areas across Latin-America, because a single case-study is a too fragile basis. But the Mexico City case shows that subcentre development does appear in Latin America, be it in a different form than in the U.S. It is likely that Mexico City shows a type of spatial development that may also be encountered in other large metropolises of the region.

7. Concluding remarks

Returning to the frame of reference, i.e. to the key-elements of polycentricity derived from the North American context, there is little doubt that many Latin American metropolises also faced growth in the number/sizes of their subcentres, while moving towards polycentric metropolitan structures. Further, it also seems logical to assume that these subcentres are now scattered over a larger territory than they were before. Unfortunately, we do not have much hard-core information about the growth and spatial distribution of Latin America's metropolitan subcentres. Certainly, quite a few authors mapped 'their subcentres'. For some metropolitan areas we have even cartographic images of subcentres at different periods. But an attempt to bring these different images together to track down subcentre evolution brought disappointing results, due to the very different definitions. Still, based on the findings of Aguilar and Alvarado, one might hypothesise that the spatial distribution of subcentres of employment in Latin American metropolises is of a more centralised nature than in North America, due to the lower levels of private-car mobility and the less developed intra-metropolitan road infrastructures.

Next, the process of subcentre development in the U.S. reflects the rise of the post-industrial economy, with its declining manufacturing base. Latin America, however, is still catching up with industrialisation, and its metropolises are important accommodators of (new) industrial investments. Contrary to North America, manufacturing still is important in Latin America's metropolitan subcentre development, and it will continue to do so in the near future. Decentralisation tendencies might even lead to the emergence of new manufacturing-based subcentres in the metropolitan peripheries.

Knowledge and insight about the current vicissitudes of Latin American inner-city areas are rather limited, certainly as to investment, economic development and employment-related issues. Despite growth of subcentres and associated erosion of the monocentric city model that also take place in Latin America, the core areas of its metropolises may still be considered the dominant, economic strongholds. The processes that determined the impressive revitalisation of U.S. downtowns over the last few decades are not likely to operate in comparable ways in Latin America.

In a time-space perspective, the metropolitan subcentres show differential growth tendencies. Some decline in size (and importance?), others rapidly grow. Aguilar and Alvarado's study even hint at interesting centre-periphery differences in this respect. Much more difficult, however, is the question whether (some of) the subcentres in metropolitan Latin America are becoming more autonomous vis-à-vis the downtowns, a topic hardly addressed.

As Aguilar and Alvarado have clearly shown, the use of spatially disaggregated employment data from the Economic Census data brings rewarding results. It is to be expected that the future availability of more detailed primary statistical data and more refined methods of disaggregation will improve our insight in the formation of subcentres and polycentric structures in metropolitan Latin America. We believe, though, that larger and more detailed sets of such data alone will not be enough. In our view, there is an unimpeded need for meticulous and comparative case-studies of spatial-sectoral development processes in the metropolitan areas.

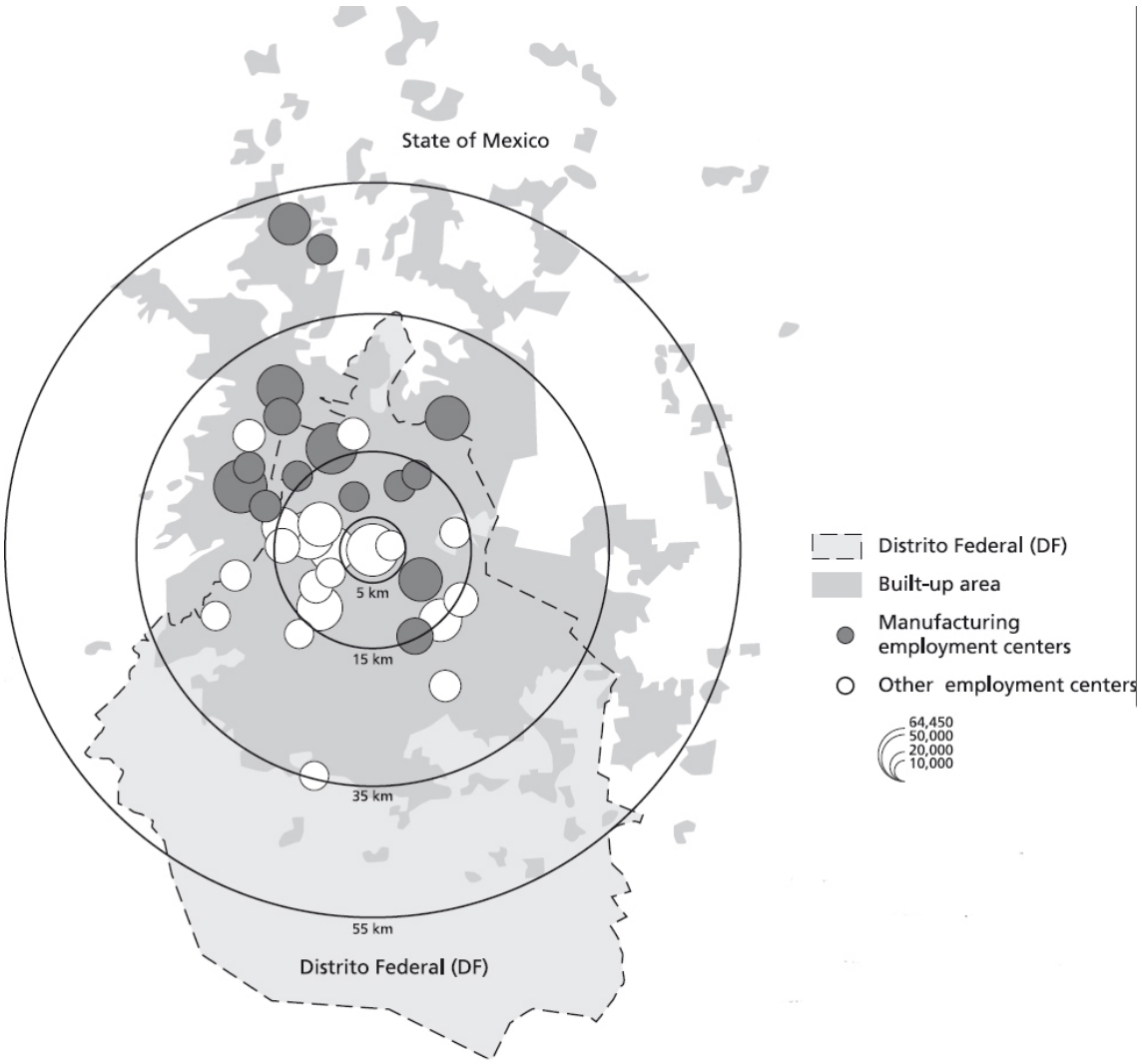

Fig. 2: Subcentres of employment in Mexico City's Metropolitan Area. INEGI, *Cuaderno Estadístico de la Zona Metropolitana de la Ciudad de México, Edición 2002* (Mexico DF, INEGI, 2002).

A research agenda to understand subcentre formation better should prioritise a few topics. First, there is an urgent need for more detailed information on the spatial and temporal development of the metropolitan manufacturing clusters (as e.g. embodied in the *parques industriales*), quantitatively as well as qualitatively. Studies of the unfolding retail structures taking into account (a fair part of) the broad retail gamut is also needed, including locational decision-making and accessibility issues.

Further, research on the commercial real-estate sectors in metropolitan Latin America would be more than welcome. From the subcentre perspective, a special focus on the spatial and temporal changes in the metropolitan office sector and its clusters would be very useful. Furthermore, the study of ongoing processes of territorial densification and functional change would be helpful to understand the interplay between social and economic processes. And finally, our research agenda grants a very important role to studies of the changing downtowns that focus on spatial and sectoral changes.

The North American literature uses high thresholds to define meaningful 'employment-centres'. In their study, Aguilar and Alvarado lowered the threshold to a minimum of 5,000 registered employees, to fit better the Mexican economic reality. Fixed thresholds are attractive for simplicity's sake, but the different socio-economic conditions across Latin America call for more flexible methodologies to accommodate for smaller metropolitan areas and/or less favourable urban living and income conditions. Formal quantitative procedures that are 'in the making' open up good perspectives because they identify subcentres by the size of deviations from the density of employment functions of the city or parts of it, rather than by absolute numerical values for size and density of employment.

Aguilar and Alvarado's 1999 data-set of 35 subcentres relates to some 675,000 employees out of a total of almost 2.9 million for the whole metropolitan area. However, according to the 2000 Mexican Population Census the labour force of AMCM exceeded 6 million workers.[68] Apparently, the Economic Census focuses on formal sector activities only, without taking the informal sector into account. In societies of advanced economies where most of the labour force is employed in the formal sector it may be logical to discard those who operating outside of it. But what about societies where informal economic activities do make up for a very sizeable part of metropolitan employment? Would it be possible that unregistered, informal activities appear in clustered forms? And if so, would it be possible that some of these clusters would meet the threshold to be considered a subcentre of employment?

Even though informal economic activities are almost ubiquitously present in the poorer areas of the Latin American metropolises, impressive informal clusters also exist. The large, 'traditional' metropolitan market sites may be a case in point. Here, the concentrations of formal, semi-formal and informal activities may easily add up to large numbers of traders, brokers, carriers, caterers and the like. Consequently, many of these market sites and their surroundings may well qualify as commercial subcentres, or seriously enlarge the employment base of a subcentre that was already noted from a 'formal perspective.' (Pilot-) studies of metropolitan areas which are known for their concentrations of informal activities will show whether the number (and/or the size) of the metropolitan subcentres might change or not, once informal activity clusters are also taken into account.

The literature on Latin American metropolitan development assumes that this development is characterised by polycentric configurations, as do their North-American peers. That assumption may be true, but we still lack much hard-core evidence to prove so. Simultaneously, we need taking our

departure from the idea that possible Latin American polycentric patterns of spatial urban development necessarily follow the North American example. For that, the demographic, socioeconomic and spatial conditions, as well as the developmental contexts of both continents are simply incomparable. To fill in the major gaps in knowledge and understanding of Latin American polycentricity, a more systematic research agenda is needed.

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The Vague, the Viral, the Parasitic: Piranesi's Metropolis

Teresa Stoppani

Piranesi's Romes

In the mid-eighteenth century Giovanni Battista Piranesi's etchings systematically document the old and new monuments, decrepit buildings and broken down infrastructures of a Rome that continues to inhabit its past. Both accurate and suggestive, Piranesi's surveys and views of Rome never fail to record the workings of time and life on the structures and spaces of the city. In his more experimental graphic works - from the *Capricci* (1744-47) to the *Carceri* (1749-50 and 1761), to the *Ampio e Magnifico Collegio* (1750) - Piranesi produces a critique of the classical language of architecture. But it is in the views of his contemporary Rome and its ruined antiquities that he offers a devastating account of the blurring of distinctions and articulations that time, use and neglect have imposed on the old differentiations of the urban and the rural, the public and the private, the monumental and the domestic. In his several volumes on the Roman antiquities (1748, 1756, 1761) ruined buildings are documented in images that represent not only their scale and magnificence, but also their decay and reversal to a state of naturalness. These works, together with the acute observations and representations of the *Vedute di Roma* (1748, 1750s and 1760s), provide the available materials that will then be dislocated, manipulated, cloned and endlessly mutated by Piranesi in the synthesis of his *Campo Marzio dell'Antica Roma* (1762), the critical canvas for the elaboration of an impossible Rome in which the historical city is almost entirely dissolved and replaced by an extraordinary congestion of fictional and yet plausible fragments.[1]

Piranesi's *Campo Marzio* has long fascinated historians of art and architecture for its rich references and spatial complexity, as well as for its challenge to architectural composition and typology and to urban structure and form. Ambiguous, it combines a recognisable topography of Rome and some of its existing buildings and ruins with a congestion of invented structures that are incomplete, interpenetrated and colliding. The *Campo Marzio* represents but also reinvents the city, offering a plan and views of a Rome in which spatial and temporal relations are constantly renegotiated on an uncontrollable fluid ground that defies Cartesian measurements and opens up a redefinition of the surface as space. As a space of critical transformation of architecture and the city, Piranesi's *Ichnographiam Campi Martii antiquae urbis* has instigated investigations and speculations also in contemporary architectural design and theory, with studies and design projects that have analysed, inhabited and expanded its spatial and urban complexity (Peter Eisenman, Stan Allen, Rem Koolhaas, NOX).

In this essay, instead of once again engaging with the *Campo Marzio*, I reasses the overall portrait of Rome offered by Piranesi's *opus* as a whole, and mainly by Piranesi's *Vedute di Roma* and *Antichità Romane*, which architectural theory and design research have often ignored and left to art historians. The *Vedute* and the *Antichità* offer a view of Piranesi's city as a prophetic anticipation of the

contemporary metropolitan condition. It is here that Piranesi documents, exposes and extracts the materials that will inform the making of the *Campo Marzio*: he represents the given - Roman *palazzi* and churches together with the decaying ruins of ancient Rome - combining the 'new' and the 'ancient' with the ephemeral constructions that were erected like parasites on and in the monumental stone ruins.

It is indeed already in the entropic development of the actual city that the canons of articulation and differentiation are vanquished. Disorder and impropriety infiltrate and take control (or rather de-control) of what used to be urban, producing a re-naturalised Rome that is reclaimed by cycles of organic growth and decay. Around it activities of a marginal economy of subsistence occupy the space of dereliction of earlier agrarian economies. These spaces of dereliction coexist and collaborate in the creation of a *terrain vague* that blurs distinctions only because it inhabits and reclaims what had previously been controlled, measured, designed, both inside the body of the city and in its dissolved surroundings. Piranesi's *terrain vague* is also populated by 'invisible' crowds, which, scattered throughout the space of the representation of his Roman views, compete for space with the ruins, sometimes blending into them.

Piranesi's representations of the spaces (and times) of Rome and of the population that inhabits them both portray and question the organisation of the space of the city, posing a challenge for the architectural discipline. Here I argue that the appropriation of the representational '*vague*', of the sociological 'viral', and of the biological 'parasitical' by the recent architectural discourse - defined respectively by architecture theorist Ignasi de Solà Morales, by sociologist Massimo Ilardi and by philosopher Andrew Benjamin - can be detected to be already present in Piranesi's representations of Rome of more than two-and-a-half centuries ago. A reconsideration of Piranesi's representations of Rome in relation to these categories suggests an alternative way to understand the importance of Piranesi's graphic spatial 'manifesto' for our present architectural concerns, especially in relation to the city and its form.

Piranesi's Rome swarms with enigmatic characters who - half man half 'thing' - reveal the dynamic time of the 'architecture of the ruin': neither static nor dead (or finished), this is an architecture of becoming, in which materiality operates beyond form, working on the properties, potentials and failures of its materials.[2] This Rome that incorporates decay, micro-changes and reinventions, becomes for Piranesi the laboratory for a process of questioning architecture that places his work beyond the debate on style and on the origin of architecture that dominated the discipline's discourse at the time. The sites of Piranesi's views, which remain for him exclusively and exquisitely 'architectural', anticipate - when they are re-read with a contemporary eye - phenomena that affect the *terrains vagues* of the metropolis today. Political, social and economic conditions have changed dramatically, but the questions asked of architecture in and by these sites allow the questioning and the challenging of the definition of an architecture of style, forms and boundaries - in the 18th century as well as in the 21st - in favour of an architecture of change. The questions though need to remain within architecture. 'In architecture' indicates issues that arise from and concern the practice of architecture, rather than being imported from other disciplines and discourses; this expression opens up the possibility for a discourse that is specific to architecture.[3]

Questions of architecture

What is the city, and what has it been? And - more importantly for Piranesi - what is architecture? This is the real question that Piranesi pursues in his explorations and representations of Rome. Omnicomprehensive - from the site surveys to the exactly measured orthogonal projections, from the details

of stone masonry to the accurate renditions of the deterioration of the materials, to the suggestive views that, proposing fantastic or hyper-realistic inhabitations, document the coexistence of a Rome '*antica e moderna*'[4] - Piranesi's entire production is underlain by one and the same question: what is architecture? For an eye that wants to see and record what is indeed all there, the ancient and modern city are inseparable in the Rome of the 18th century, coexisting in the layered urban space. In his images Piranesi works on the ruins of Rome, but these are, in fact, the ruins of the discipline: in his *vedute* he dissects, together with the Roman ruins and monuments, also the language and the rules of the discipline, aware that its crisis has long passed the breaking point. By carefully documenting and also theatrically staging these ruins (and their decay), Piranesi questions the changes that take place in and on them. Beside and together with the decomposition of the physical ancient structures, what Piranesi interrogates is the agency of this change. The material transformations of these structures and their reinvented uses are the sites for the emergence of 'other' forms of construction and inhabitation that contradict the order of architecture - both its property and its propriety.[5] The questioning of architecture here goes well beyond the issues of its style and origin. Far from the debate on the 'true' origin of architecture - the big diatribe on Greece versus Rome that Piranesi addresses directly and eloquently in his other works both graphic (for instance in his *Camini*)[6] and written (in a series of polemical texts that include the *Parere su l'architettura*)[7] - here Piranesi represents the enactment of an ongoing architectural 'beginning by remaking', by reinventing an 'other' architecture of survival. This 'other' architecture is a process of recycling and infiltration that operates slowly but continuously, fragmented to the level of pulverisation, dispersion, diffusion of the material.

The ruins of Rome are the sites of Piranesi's interrogations. It is here that he looks for answers, because for him only Rome can offer a repository and a reservoir of information that condenses in a layered and unsettled body a wealth of different styles and times. For Piranesi, Greece

will not teach him about capitals, because … there are none that bear comparison with Roman capitals; it will not teach him about columns, because there are so many more in Rome of every sort and size; it will not teach him about the statues of bas-reliefs - one finds these in Rome in the greatest abundance and elegance, in comparison to those of the Greeks; … to find Greece we should look no further than Italy.

Rome is for Piranesi 'the most appropriate place to learn these arts'.[8] As if unsettled and rearranged in their vertical and horizontal proximities by sudden geological transformations, the margins of the city - both external and internal - offer Piranesi the sites where the process that informs his 'research' by images has already begun, by itself. The soft sites of the city that have already undergone a transformation of their architectural and urban order in fact raise questions (of the discipline, of the architect) that are formulated in matter and in material changes, before they are formalised by the measurements of the survey, the lines of the drawing and the questioning words of the treatise.

This is the multilayered Rome evoked by Sigmund Freud over 150 years later to describe the possibility of the concurrent existence of different stages of perceptions and memories in the mind, a construction that combines 'the survival of something that was originally there, alongside of what was later derived from it'. For Freud the pictorial description of the city can only 'represent historical sequence in spatial terms […] by juxtaposition in space'; but Rome is exceptional and offers the closest spatial configuration to the complexity of the mental life, as 'all these remains of ancient Rome are found dovetailed into the jumble of a great metropolis which

has grown up in the last few centuries since the Renaissance.'[9]

In Piranesi's Rome, stone, flesh and mud combined together produce the exposé and 'critique by making (undoing)' which, meticulously recorded by his etchings, challenges architecture beyond the solidity and stereometry of its construction. While the construction of architecture's 'proper' project has long ended, time remains at work on its materials. Piranesi's surveys, views and measured architectural details record this as well. There is no editing out of the improper here, but rather an emphatic representation of it - emphatic by diffusion: the sprawling of the inhabitants of the ruins does not seem to know boundaries between open and close, old and new, private and public. Oblivious of boundaries these figures are everywhere; they occupy, squat, vandalise, reuse, dwell, loiter, pose, stay (still), they occasionally work. They just are. But, who are they? Beyond their social or professional (and economic) qualities, this question addresses the purpose of their presence for Piranesi on at least two levels. In the space of representation they are elements of scale-comparison and measurement to highlight, by contrast, the magnificence of colossal monuments and the technical prowess of the territorial infrastructures of the Romans; ant-like and sprawling everywhere, these creatures relieve the over-scaling of the edifices of imperial celebration even in their state of decay. In the space of the city, they occupy this decay and are themselves the agents of change, collaborating with the slow but unstoppable and ineluctable erosion of architectures and urban structures, witnessing and living through the collapse of the principles, political orders and organisational system that such structures represent. Politically - and architecture is inevitably political and always implicated with the political - these 'improper' creatures are witnesses of the long decadence of the Roman *imperium* - republican, imperial, papal. In architecture, ephemeral and fragile in their individuality but collaboratively timeless, they undermine the integrity of the edifice of architecture and suggest new ways of inhabiting and making space.

Piranesi's images of Rome portray the enactment of a space-making intervention that, without an architectural project and through the workings on material of time (and of man), operates outside the imperative of form. This is the land of sustenance and survival, of the precarious and the haphazard, and in Piranesi's Rome it coexists with the solid, the magnificent and the decaying beautiful. Architecture here does not dictate form but it offers reusable materials, makeshift shelters, renegotiable types and uses of space. The dissection operated by the ruin exposes an architecture of incomplete form and of change produced by time, by man, by *incuria* (negligence as lack of care and maintenance); it reveals how the architecture of the proper, of the magnificent and the monumental is possible only with the application of constant work. Suspended between the space of the representation and the *terrain vague* of the 18th-century city, the inhabitants of Piranesi's images are not to be read as human stories but as architectural agents. They are not human. Piranesi is no *ante litteram* sociologist or anthropologist, and the humanity he represents is not the object of a social study or survey, but part of the economy of an image (the whole series of them) that interrogates architecture and the order of the city. Piranesi's human beings - most of them derelict and almost unrecognisable as such - are in fact the objects and instruments of architecture: elements of the construction of the architectural representation, scale rulers for the measurement of the architecture represented, material additions and complements to the rotting built edifice. They represent and are part of an architectural stage (both phase and representation) in which organic and inorganic, mineral, vegetal, animal and human fuse in an environment that is not regulated by form but governed by change. One could argue that this reading of Piranesi's space is inevitably postmodern

and post-Deleuzian.[10] Perhaps Piranesi's take was or would have been different. But his acute instrumental use of his figures seems to suggest that they are such: instruments - and particularly architectural instruments for an architectural discourse by figures. This is indeed accompanied by Piranesi's accurate and systematic cataloguing of Roman ruins (objects) and their building blocks - parts and fragments. Piranesi catalogues the 'parts', those recognisable architectural elements that belong to the codified architectural orders and contain in their geometric and ornamental definition the genetic coding of the whole to which they belonged, and could possibly return to belong. The part can be identified as part of a whole, and the whole, even when it no longer exists, can be regenerated or at least evoked by the part itself. Piranesi represents in his views and uses in his compositions also the 'fragments': those parts that are broken beyond recognition, and whose features have been altered beyond a possible attribution to a whole and beyond a recollection of their origin. Broken and broken loose, unrecognisable and free to 'not belong', the fragment becomes generative of new possible constructions, which do not re-compose a given order or reconstitute a predefined form. The fundamental difference here is that the part is ultimately independent of its material constitution and is governed by formal definition and specification (both verbal and geometrical), while the fragment and its possibility of a re-engagement with form is inextricably connected with its material nature.

Fragments are offered by Piranesi in his rich production of documentary Roman views - environments, contexts and assemblages of which the *Campo Marzio dell'Antica Roma* (1762) offers a misleading treasure map (there is no treasure to be found there, as the map can only be inhabited but never decoded). Fragments occupy the mirrored reality of Piranesi's fantastic views, of the *Capricci*, of the *Carceri* (urban prisons so vast and open that they let us see the city in the background - they are indeed in Rome, or better, they *are* Rome).[11]

The presence of the human figures in Piranesi's views provides another take, which allows him to move rapidly and in one step from the part to the fragment, from the broken object to the inhabitation of space, bringing together at once the categories through which architecture can be reconsidered: the project (design), its representation (drawing), its construction (building). These inhabitants, often creatures between the thing and the animate being, between the crumbling of stone and the rotting of organic matter, break the boundaries of form and time, and allow Piranesi to break the divisions of categorisations and taxonomies, and to weave a discourse on space, by images. The improper of architecture, the stillness of its representation, and the *vague*-ness of its physical presence in the space of the city are the issues raised by Piranesi's Roman works, encrypted in his apparently conventional antiquarian views of the city. Well beyond being technically and artistically excellent, these images construct a research, a discourse and an interrogation on architecture and its space, and on the organisation of urban space at large, which parallels and surpasses the concerns with the origins of the discipline expressed by Piranesi in his writings.[12]

***Vague*: soft ground**

Piranesi's Rome and its marginal spaces are not an un-inhabited empty space, but a *terrain vague* of improper inhabitation, abandoned by the control of legal, spatial and indeed architectural orders. Its inhabitants are the agents of a transformation, a renewal that can only inhabit the 'vague'.

In architecture and urban studies the term *terrain vague* was born (or reborn) in the mid-1990s, when Ignasi de Solà-Morales used it to indicate an 'abandoned space in which a series of occurrences have taken place'.[13] In the visual arts the paternity or appropriation of the term is attributed to Man Ray in the early 1930s. Before Man Ray

and perfectly fitting Solà-Morales's definition, Jules-René Lalique's photograph *Terrain vague*,[14] a very urban view, represents in a Parisian photographic update what Piranesi had drawn and etched of Rome: an urban lot that is not only vacant, but also still filled with ruins and debris, and already taken over by vegetal growth. In both architecture and photography the term *terrain vague* (or rather its use) seems to be inextricably linked with representation, with the fascination and at the same time the difficulty of representing such space. Be it in the optics of contemporary planning, or in the fascination of early photography become urban detective - the artificially-enhanced camera-equipped eye enabled at last to see and document what 'should not be there' - the *vague* seems to be mainly an issue and a problem of the visual. It is the same for Piranesi's views of Rome, in which the precision of the etched line has to represent the vagueness of a parasitic presence - human, animal, architectural - that inhabits the ruined architecture of the proper.
Time is never still in the *terrain vague* - nor does inhabitation flee it. Images resolve the vagueness of the *vague* with juxtapositions of the impossible become possible, of the broken (mineral or human) with the amazingly partially intact vestiges. They represent the mysteries of partial intactness, which resists while next to it life decomposes and the new-old pullulates. This is the *vague*.

As Solà-Morales points out, photography, with its evocative and emotional connotations,[15] seems to be the only proper tool to measure such spaces. Piranesi is able to anticipate this with the 'vagueness' of his line - and this is not in contradiction with its precision. Piranesi's *terrain vague*, like the contemporary one of Solà-Morales's definition, is awaiting things to happen, already overloaded with traces that are more than a palimpsest, and, most importantly, are already the site of processes in the making. These processes and the presences that enact them are what both interests and 'bothers' Piranesi in relation to the architectural debate of his time, and that is why he represents these 'other' processes. Nothing new here, apparently: an artist portraying urban destitution and the life of the poor; an engraver representing ancient ruins; an architect surveying ancient monuments, celebrating their magnificence, taking their measurements, cataloguing their technical details, documenting their material properties and recording their weathering. But all these occur together at once here, in a synthesis of times and roles. It is - as in later representations of the *terrain vague* - the juxtaposition and blurring of boundaries (both spatial and temporal) that produces questions and opens new possibilities and that - like the terrain it works on - moves. The question to ask about Piranesi's etchings then is not only why he represents these spaces - they were obviously abundant in the Rome of his time, and their representations were not only a tool of scholarly antiquarian research but also a commercially-profitable artistic enterprise - but why he makes his *terrains vagues* so very much and very lively inhabited.

That which is *vague* cannot be measured and rendered. That which is *vague* escapes the control of form (and its figure) because it changes. It *is* change, it redefines space and produces space in dynamic terms. For the order of classical architecture and its geometry, this is a revolution. Thus defined, at the time of the disputes on the 'true' origin of architecture and on its proper language and grammar,[16] the *terrain vague* is an environment that is visible to all but systematically ignored by academia beyond the antiquarian love of the ruin. It hosts and sparks a powerful revolution that pre-empts the debate on style and opens up architecture to a dynamic time. Beyond the disputes on Greek versus Roman, or bare versus highly ornamented, the ruination that affects the architectures of the *terrain vague*, and the agency of its inhabitants in its ruination, bring to the forefront the necessity of a reconsideration of architecture in its materiality and tectonics - and that is what Piranesi is interested in and what he

copiously represents.

***Viral* culture**

The *terrain vague* has no form, it changes, it is dynamic and available - it moves. 'Virus space' moves *and* is agent of its movement. For Ignasi de Solà-Morales *vague* has the triple signification of 'wave', 'vacant' and 'vague'.[17] Characterised by instability, available emptiness, and the indeterminacy of its boundaries, the *terrain vague* is the fascinating and photogenic ground of a potentiality that remains often unexpressed. With the idea of 'virus sites', Italian sociologist Massimo Ilardi (1998)[18] acknowledges that the contemporary city is in fact already enacting the potentialities of its *terrains vagues*. Moving swiftly in time and across volatile boundaries that escape the definitions of legality, 'virus sites' in fact activate the dormant potentiality of vagueness. In shifting the discourse on the abandoned, disused, and 'uninhabited' from the *terrain vague* to the 'viral', Ilardi places the emphasis on the disruptive, pervasive, expanding forces that the *terrain vague* can only expect and evoke, and focuses instead on the agency of change of the spaces of what is (only apparently) *disabitato* (uninhabited). 'Virus sites' are characterised by the shifting, temporary and highly volatile nature of their development and flourishing. Like viruses, these spaces are opportunistically inhabited, thrive, grow and multiply where and when conditions are favourable.

Ilardi's discourse, immersed as it is in the post-capitalistic dynamics of the contemporary metropolis, might seem a far (and inappropriate) cry from the destitute crowds that swarm Piranesi's views of eighteenth-century Rome. But the dynamics of the 'other' that are triggered by such inhabitation of the city in its margins both internal and external are similar in their spatial operation. What matters here, and what is Piranesi's concern, is the architectural. The chronological and socio-political leap is possible then if the attention remains focused on the architectural and on its production of space in those soft grounds of constant mutations that are the *terrains vagues* - in the eighteenth as well as in the twenty-first century.

The decomposing antiquity that Piranesi records in his views of Rome documents in fact a stage of the viral development (infection?) that was occurring already then, at a slower pace and in smaller numbers, and anticipated today's urban 'virus sites'. What the two have in common is their agency on the existing, not as yet another project that destroys and replaces material with material, form with form, but as the opening of a possibility to work with the given, altering it from within. The incompleteness of the given indeed offers the soft spots that allow transformations as plug-ins and grafts, rather than as replacements and reconstitutions. The focus here shifts again on the material of architecture, and while Ilardi's argument concentrates on the social nature of urban phenomena, these have indeed a physical counterpart that affects architecture. As in nature's ecosystems, the environment that allows certain activities is by such activities modified, in a process of rebalancing adjustments that keep the physical transformation of space going. The proliferation of human activities that Piranesi portrays in and around the remains of ancient Rome in fact knows no boundaries, it makes no distinction between a closed protected inside that is controlled and organised, and an outside of 'scattered' ruins. Torn open, devastated by time and neglect, the city becomes porous to a myriad of small exchanges between inside and outside, which, so diffuse, undermine and dissolve the distinction as such. A similar process occurs in the shifting of the ground, in which overgrowth and landfill question the notion of horizontality and verticality, open and close, hard and soft, in a muddling (and mudding) that only the editing lines of Giovanni Battista Nolli's plan could somehow rectify.[19] Piranesi instead sees and represents the presence of these forces and inhabitations; he explores and documents the chal-

lenged horizontality of the city, beyond the natural orographic conditions of the Roman site and including the artificial topography of a ground already articulated, excavated and redefined by centuries of human interventions.

For Ilardi,

The terrain vagues *are the territories abandoned by the law […]. They are spaces devoid of symbolical meanings, of precise functions, of settled activities, and therefore spaces of utmost freedom. Uncultivated and undefined lands, they have been abandoned by the ancient city and by its institutions because they are now devoid, for their dislocation, of any economic and social value. The* virus sites *are instead the* terrains vagues *that acquire 'publicness', that is, become once again public spaces in the moment when they raise the problem of their presence in the city 'as a possible factor of destruction of its established order' and of its values.*[20]

Ilardi's socio-anthropological definition of 'virus sites' in the city is significantly derived from the architectural discourse on the contemporary metropolis (Ilardi quotes and borrows the term from Italian architect and architectural theorist Franco Purini). In Piranesi, two-and-a-half centuries before the development of a sociological discourse on the viral sites of the contemporary metropolis, the question remains strictly architectural, and it is made evident, silently but explicitly, by the graphic nature and visual contents of his drawings and etchings: what Piranesi decides to represent and how he does it, becomes both crucial and critical.

In Piranesi's 18th-century Rome the 'public-ness' of the viral spaces is not that of a general accessibility and frequentation (although these remain in fact possible), or that of a public and cultural identification. What 'becomes once again' here is the architecture itself, which is reused, reinvented and modified. The architectural and archaeological interest in these sites constitutes a passive moment of documentation; it produces a theoretical and philological reconstruction (interestingly, Piranesi does not reconstruct); it is an operation of cultural (and indeed physical) ransacking; it suggests a possible physical restoration and reconstruction - here the polemics on style of the 'in what style should we build'[21] are anticipated by the 'in what style should we rebuild' question (and how much of it). The inhabitations that here take place produce instead a reactivation of the broken form as a 'continuity with change of activity' that does not require the reconstitution of the broken whole: the physical environment and its inhabitation mutually adjust to each other. These inhabitations of the incomplete show the incubation stage of the viral explosion in the *terrains vagues* of the city (the economical and political trigger agent may be dormant here, but it is already present). Piranesi's work can then be re-read today, *ex post*, as a laboratory for viral culture: for the growth of a biological material that expands its definition into the architectural, to include its physical matter, its definition of space, and the practices and cultures of its occupation and perception.

For Ilardi the virus sites are 'no longer spaces created by ordering systems, but by disorder, by irregularity, by anomy, by the instability of the bodies that move across them. Spaces without form and without measure, and therefore without organization and law.'[22] Piranesi's spaces at the margins of the historical city - both external and internal, and all the way down to the grain of the materials of the buildings - anticipate the tears and the breaking of orders of the contemporary city. By questioning the orders and the making of space of the classical city, his work opens up the possibility for these spaces and their representation, before they happen in the contemporary city. By recording a de facto reality that undermines and inhabits from within the formerly urban, his views portray 'places of the provisional which demystify any centrality, any compact and close system, every knowledge and

form that proclaim themselves definitive and homogeneous'.[23] Piranesi represents this on the margins of the city, but also in the internal undoing of the body of Rome. He represents not only the objects - new and intact in their monumentality, or ancient and crumbling and broken - but also what surrounds them, the (rotting?) flesh of the city. Here the difference between the *Vedute di Roma* (1748 and later) and the *Antichità Romane* (1756) and *Della Magnificenza ed Architettura de' Romani* (1761) becomes clear. And yet the signs of time are not absent from the documentary representation of the ancient object, even when this is taken apart in the taxonomy of the measured survey rather than in a pictorial rendering of its remains, or when the 'as-it-was' state is represented (but always in conjunction with the 'as-it-is'). In the detailed documentations of ancient architectural elements, the breaking, undoing and opening up is transferred to the level of the materiality of the components of architecture, of the weed shooting from the cracks in the wall, of the efflorescence of stone and the peeling of plaster, or the growth of mould. What emerges here as the agent of change is the material, the bodily - human presence included. For Ilardi, in the contemporary city '[i]t is the material individual in its constitutive and irreducible corporality that produces the metropolis'.[24] In Piranesi's views the body becomes the complement of the broken architecture of the ruins, collaborating and becoming one with the broken tissue of the architectural body - scarring it, grafting on it, somehow healing it. Fundamentally, the operation that the individual bodies perform on the remains of architecture is a swarming activity that is not facilitated, organised or regulated by architecture. It in fact operates with and around architecture, besides it, almost notwithstanding it. In making do, it makes, it undoes and changes its host.

Parasitic **inhabitations: the thing**

'Parasites intrude and inhabit. In so doing their presence demands a rethinking of sites of inhabitation.'[25] In 'Parasitism in Architecture', Andrew Benjamin redefines the parasite in architectural terms by moving beyond the parasitical appearance of the form of architectural designs and structures, to analyse instead their parasitical behaviour.[26] What is essential for a definition of architectural parasitism beyond form is the move from the literal - what the parasite looks like[27] - to the figural - what it is that the parasite does. The question that allows Benjamin to define parasitism in architecture beyond and besides simple appearance is then 'how, in architecture, is parasitism to be understood once it is no longer reducible to its literal presence?'.[28] In order to answer this question Benjamin analyses the relationship between the parasitical guest and its host in terms of both site and time. In terms of site relation to the host, a key condition for the survival of the parasite is 'its refusal to recognize lines that mark out pre-existing edges and boundaries. In refusing certain edge conditions the parasite constructs its own edge condition. That refusal however can be neither indifference nor destruction. 'Any compromise undertaken by the parasite becomes a structural transformation of the site'. By inserting itself the parasite alters the boundaries of the host. A transformation without destruction is necessary for the survival of the host, and consequently of the guest itself. The parasitical relation, that is, must operate for a conservation of the host, with which 'the parasite has to negotiate the space of its internal incorporation'. The crucial point that emerges from these considerations is the intrinsic ability of phenomena of parasitical inhabitation to intervene within an already existing site that is to be both maintained and transformed at the same time. The 'transformation is essential not because the parasite has to transform the site as such - though this is always a possibility - but because the *conditions of edge and boundary* that establish the site have to be *transgressed and thus reformed* by the presence of the parasite'.[29] At this point Benjamin moves on to define the figural in architectural parasitism in terms of time, that is, through a process of dynamic adaptation to the 'absorbing infrastructure'

that establishes between the parasite and its host changing relations of limited duration.[30] Benjamin is concerned with the architectural parasitism performed by projects and built structures on other and otherwise organised built structures and urban spaces. This is parasitism performed by architecture on architecture (and urban space). But in Piranesi's representations of Rome the distinction between architecture and inhabitation is still blurred. There is in his views - their main feature - the official architecture of stone of the Roman ruins (the main feature and the subject of his etchings), but this is already compromised by the erosion perpetrated by time and by man. This architecture is already broken, its forms and boundaries already blurred, and literally crumbling. There is also the parasitic occupation of the ruins by shacks, makeshift shelters, improvised dwellings, carried out with salvaged materials likely to have been ransacked and recycled from the very same structure they occupy, or often simply coinciding with the body and the ragged clothing of the inhabitant. This is a stage in which architecture is still 'carried on the body' (a satchel and a stick that can become a tent), and a case where the parasitical (or viral) intrusion is performed by human bodies and by some basic and precarious props (tools of survival). In some cases it is the bare human body that finds accommodation in the cracks of the broken old structure, thus reinventing uses for the crumbling existence (of both the architectural ruin and the human body). This is a pre-architectural tectonic act performed on and through the body itself.

Piranesi's ruins and derelict spaces of Rome are not only inhabited by recognisable characters whose social roles are delineated by their costumes, the tools of their trade or the activities they perform - surveyors, architects, 'tourists', aristocrats, craftsmen, washerwomen, greengrocers, peasants, tramps and beggars. Beggars - but they are indeed unidentifiable figures - are most often supported by a stick or a perch, a necessary prosthetic complement for perambulation on the rough terrain of the 'undone' city, and already a tectonic element as well as a survival weapon. Incomplete beings otherwise, these creatures are like the incomplete architectures in which they wander, loiter, sink. Other bodies are even less identifiable as human beings - they drip rags, half sink in mud, grow vegetation, become stone. A lost humanity inhabits the cracks and crevices of an entirely artificial and yet brutally re-naturalised urban landscape in the *terrain vague* of Rome. Piranesi's fast nervous line allows him to blur and blend flesh and stone, creating characters which are neither and both at the same time, between living stone and mineralised body, breathing statue and petrified human being, in a symbiosis in which the body temporarily sutures the wounds of architecture and crawls the grounds of a horizontality that needs to be redefined - anticipating the dynamic and the undefined of the *vague*, and the precarious and the volatile of the *viral* of the contemporary city.[31] Part human, part animal, part vegetal, part mineral, Piranesi's creatures carry out a fantastic appropriation of the spaces and architectures of Rome by improper or unplanned uses; they also operate a reversal, returning architecture to the essence of its pre-formed matter. They perform a cellular-molecular transformation of the material of the 'architecture of the ruin', suggesting 'other possible reconstitutions, in a new project of architecture that, having rejected the uniqueness and singularity of its origin, is by definition multiple and open'.[32]

The political and social conditions of the contemporary city and of Piranesi's eighteenth-century Rome, their demographics and cultural dynamics and the very speed of their changes are different, but the architectural physical processes of gradual substitution and internal operational changes - the parasitical operations of 'maintaining and transforming' - are the same, if the discourse is kept strictly in the architectural, as Piranesi does. Beyond the urban-representational (Solà-Morales) and socio-anthropological (Ilardi) interpretations of the images, an architectural reading of Piranesi's

representations of eighteenth-century Rome allows us to draw links across different times and different operational speeds for an understanding of those *vague*, unstable, and liminal spaces that the city has always had. In this context the architecture of the city is always already redefined beyond the Vitruvian canons of *firmitas*, *soliditas* and *venustas*, as a dynamic process of making, transforming and inhabiting space.

Notes

1. For a recent publication of Piranesi's complete etchings see Luigi Ficacci, *Piranesi: The Complete Etchings* (Cologne: Taschen, 2000).
2. I have analysed some of the figures that inhabit Piranesi's etchings in Teresa Stoppani, 'Voyaging in Piranesi's Space. A contemporary re-reading of the beginnings of modernity', *Haecceity Papers*, 1, 2 (Spring 2006), pp. 32-54. There I suggest that the presence, attributes, behaviours and movements of those characters are fundamental spatial and temporal indicators: the 'incorporation' of the multiple figure of the architect/observer in the *Carceri* offers a haptic reading from within of their exploded order; the presence of women in Piranesi's Roman views and antiquities produces an 'irruption' into architecture of external forces of a practical reality of pre-industrial production, both instantaneous and eternal; the architects and visitors to the ruins represent the static time of an architecture that is 'frozen' and 'inserted' as permanent presence in a constructed official history; while the marginal world (marginal, that is, to both the social structure and the construction of the image) of the beggars, the loiterers, the shacks, the mud, the debris that are present in all the images of Piranesi's Rome offers the dynamic time of the 'architecture of the ruin', an architecture of becoming in which materiality operates beyond form, working on the properties, potentials and failures of its materials.
3. The term 'in architecture', used to 'signal the practice of architecture and therefore its material presence' is discussed by Andrew Benjamin in his *Architectural Philosophy* (London: Continuum, 2000). Here Benjamin addresses 'the particularity of the architectural' (p. vii) and its thinking, and considers architecture not 'as a language, or as a sign system or as the domain of examples' (p. viii) from which philosophy draws, but as 'indissolubly connected to function' (p. 1) For Benjamin architectural 'function cannot be thought outside a complex structure of repetition' (p. 1), and his argument on a specifically architectural thinking is therefore developed in relation to time and function. The notion of repetition, with the interruption and the alterity that are its correlates, allows him to open up the argument of an independent architectural thinking that specifically links function and time.
4. Piranesi published several series of views of Rome. The first series was included in a publication that also included work by other artists, *Varie vedute di Roma antica e moderna disegnate e intagliate da celebri autori, in Roma 1748, a spese di Fausto Amidei Libraro al Corso* (Rome: Amidei, 1748).
5. The ideas of the 'proper', 'propriety' and 'property' in architecture are discussed in Catherine Ingraham, *Architecture and the Burdens of Linearity* (New Haven and London: Yale University Press, 1998). See in particular chapter two, 'What is Proper to Architecture', pp. 30-61.
6. Giovanni Battista Piranesi, *Diverse maniere d'adornare i cammini ed ogni altra parte degli edifizi desunte dall'architettura egizia, etrusca, e greca con un ragionamento apologetico in defesa dell'architettura egizia, e toscana, opera del cavaliere Giambattista Piranesi architetto* (Rome, 1769).
7. Giovanni Battista Piranesi, *Parere su l'architettura, con una prefazione ad un nuovo trattato Della introduzione e del progresso delle belle arti in Europa ne' tempi antichi* (Rome: Generoso Salomoni, 1765). Now translated in Giovanni Battista Piranesi, *Observations on the Letter of Monsieur Mariette; with Opinions on Architecture, and a Preface to a New Treatise on the Introduction and Progress of the Fine Arts in Europe in Ancient Times* (Los Angeles: The Getty Research Institute, 2002). The volume contains a lengthy and comprehensive introduction to Piranesi's polemical works by John Wilton-Ely, a topic that Wilton-Ely had

already addressed in the introduction to an earlier facsimile Italian edition of these works, *Giovanni Battista Piranesi, The Polemical Works, Rome 1757, 1761, 1765, 1769* (Farnborough, Hants.: Gregg International, 1972).

8. Giovanni Battista Piranesi, 'Observations on the Letter of Monsieur Mariette', in *Observations on the Letter of Monsieur Mariette*, p. 89.
9. 'There is certainly not a little that is ancient still buried in the soil of the city or beneath its modern buildings.' Sigmund Freud, 'Civilization and Its Discontents' (1930[1929]), I, in *Civilization, Society and Religion: Group Psychology, Civilization and Its Discontents and other works*, The Penguin Freud Library, vol. 12 (London: Penguin Books, 1991), pp. 251-60.
10. See Teresa Stoppani, 'Voyaging in Piranesi's Space', and Teresa Stoppani, 'Translucent and Fluid: Piranesi's impossible plan', in M. Frascari, J. Hale, B. Starkey (eds.), *From Models to Drawings: Imagination and Representation in Architecture* (London: Routledge, 2007). In these texts I propose a reading of Piranesi's etchings as both a representation and a construction of a new notion of space – open, infinite, changing, smooth, dynamic – which still engages the efforts of contemporary architectural and spatial practices. I recur to the Deleuzian notions of 'smooth' and 'striated' space (see Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (London: Athlone Press 1988)) as contemporary tools for a re-reading of the space of the pre-modern city beyond the distinction of urban and rural, in an attempt to identify elements of contiguity, continuity and coexistence rather than contrast, and focusing on the processes of continuous reworking of the urban space that infiltrate and defy (and are a constitutive part of) the Enlightenment project of rationalisation and ordering.
11. I have suggested this in Teresa Stoppani, 'Voyaging in Piranesi's Space'.
12. See Giovanni Battista Piranesi, *Observations on the Letter of Monsieur Mariette*, op cit.
13. Ignasi de Solà-Morales Rubío, 'Terrain Vague', in Cynthia E. Davidson (ed.), *Anyplace* (Cambridge MA: MIT Press, 1995), pp. 122-23.
14. Jules-René Lalique (1860-1945), *Terrain vague et façade (pharmacie)*, 1905 (Paris: Musée d'Orsay). Available from <http://www.photo.rmn.fr/c/htm/Home.aspx> [accessed 17 May 2009].
15. Solà-Morales Rubío, 'Terrain Vague', *Anyplace*, op cit., pp. 118-23.
16. Piranesi reflects on this in his dialogue *Parere sull'Architettura* (1765). Giovanni Battista Piranesi, 'Opinions on Architecture: A Dialogue', in: *Observations on the Letter of Monsieur Mariette*, pp. 102-14.
17. Solà-Morales Rubío, 'Terrain Vague', in *Anyplace*, pp. 122-23.
18. Massimo Ilardi, 'Virus City', in *Gomorra: Territori e culture della metropoli contemporanea*, 1, 2 (June 1998), pp. 10-12. All translations from this text are mine. See also the more extensive '*Virus city o del vuoto*', in Massimo Ilardi, *Negli spazi vuoti della metropoli: Distruzione, disordine, tradimento dell'ultimo uomo* (Torino: Bollati Boringhieri, 1999), pp. 98-116.
19. I refer here to Giovanni Battista Nolli's famous plan of Rome, *Topografia di Roma* (1748). I have discussed Piranesi's and Nolli's different ways of representing Rome in the context of their collaboration for the production of a smaller version of the plan, the so-called *Small Nolli*, in Teresa Stoppani, 'Translucent and Fluid: Piranesi's Impossible Plan'.
20. Massimo Ilardi, 'Virus City', p. 10. Quoting Francesco Purini, 'La città narcotica', in *Le architetture dello spazio pubblico* (Milan: Electa 1997). My translation.
21. 'In what style should we build' (*In welchem Style sollen wir bauen?*) is the title of Heinrich Hübsch's 1828 book that sparked the debate on the search for an appropriate architectural style in the German architectural discourse of the early 19th century. Produced around the mid-18th century, Piranesi's oeuvre precedes this debate and is interestingly chronologically placed between it and the earlier 18th-century debate on the true origin of the classical language of architecture – the 'Greek vs. Roman' debate. While Piranesi supports the re-elaborative richness and experimental freedom of Roman architecture and proclaims its independent origin under the influence of the Etruscan civilisation, his studies of Roman ruins place a particular emphasis

on the structural, the material and the tectonic aspects of the Roman achievements. In a way, both his writings and his etchings seem not only to anticipate an answer to the 18th-century question on style, but also to surpass the question itself by suggesting new languages and orders beyond the re-composition of the given. Piranesi's work breaks with both the classical architectural order and the urban one. On this, see Manfredo Tafuri's readings of Piranesi's *Campo Marzio dell'antica Roma* and of his altar of San Basilio for the church of Santa Maria del Priorato in Rome, in Manfredo Tafuri, '"The Wicked Architect": G.B. Piranesi, Heterotopia, and the Voyage', in *The Sphere and the Labyrinth (Cambridge, Mass.: MIT Press, 1987)*, pp. 25-54. On the debate on style in the 19th century see *In What Style Should We Build? The German Debate on Architectural Style* (Santa Monica CA: The Getty Center for the History of Art and the Humanities, 1992).

22. '[W]ith the destruction of every institutional purpose or habit, these new spaces are legitimated to function as large laboratories for new social and political alchemies. In the virus sites of the metropolis, anything that belongs to the practice of destruction and "illegality" is therefore *public* and *legitimate*. […] whenever a conflict creates a vacuum of legality […] virus sites are immediately defined there.' Ilardi, p. 11. My translation.
23. Here I am applying to Piranesi's images Ilardi's words on the 'virus sites' of the contemporary city. Ilardi, p. 11.
24. Ilardi, p. 12.
25. Andrew Benjamin, 'Parasitism in Architecture', in *Ephemeral Structures in the City of Athens. International architectural competition. The programme* (Athens: Cultural Olympiad 2001-2004, Hellenic Cultural Heritage SA, 2002), pp. 55-61. Quote from p. 55.
26. '[The] twofold nature of the parasite redefines the relationship between guest and host. Parasitism will undo any straight opposition of the form guest/host. […] There is an inherent social dimension to the complex logic of parasitism. The term raises biological, ecological and anthropological issues. The question however is what does it mean to position the parasite, the guest and the host - as marking out occurrences that occur in architecture.' Benjamin, 'Parasitism in Architecture', p. 55.
27. In the literally parasitical 'the formal presence of the work would be such that its incorporation would allow it to remain formally distinct and yet programmatically interconnected with its host. […] [A] fundamental element of literal parasitism is the object's visual presence'. Benjamin, 'Parasitism in Architecture', p. 55.
28. Ibid., p. 56.
29. Ibid., p. 57. My emphasis.
30. '[B]y concentrating on movement and allowing relationality to determine the continuity of its configuration, the site then opens up the possibility of parasitical relations that can only be sustained for periods of finite duration. Indeed, their presence as architectural possibilities would be defined in temporal terms.' Benjamin, 'Parasitism in Architecture', p. 60.
31. See 'Materiality: the Thing as Architecture', in my 'Voyaging in Piranesi's Space', pp. 47-50.
32. The 'architecture of the ruin' is 'the opposite of the "ruin of architecture", which decrees a failure of architecture when its forms are not always already and lastingly defined. This distinction is at the basis of Piranesi's dynamic and critical relationship with the language of classical architecture: the incompleteness or the failing of the ruin is not simply the witness of a past that must undergo antiquarian restoration, intended as reconstitution of a broken whole; nor is the fragment a relic to be isolated, recontextualized and venerated as new whole. The broken piece, the fragment, the incompleteness of the ruin […] suggests instead other possible reconstitutions, in a new project of architecture that, having rejected the uniqueness and singularity of its origin, is by definition multiple and open.' Stoppani, 'Voyaging in Piranesi's Space', pp. 49-50.

Biography

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Interpreting the Contemporary Metropolis: Notes on the Urban Debate and on Ignasi Solà-Morales

Gonçalo M. Furtado C. Lopes

1. The Legacy

1.1

The theory of architecture and urbanism face the difficult task of addressing the ever-increasing complexity of the contemporary metropolis. In this sense, the legacy of historian and architectural theorist Ignasi Solà-Morales stands out for its sharp, generous and open perspective.[1] I clearly remember how the news of Ignasi's untimely death in 2001 shook the architectural milieu. As a former student of his, I found myself remembering the impact of some of his teachings. For three nights, with the highway as a companion, I set about to organise a set of notes related to Ignasi's unique theoretical work, and remembered my contacts with the professor through his writings. His enigmatic work has the genuine capacity of creating a cartography illuminating the city in its contemporary complexity. This text consists of a series of notes related to the urban debate and to professor Ignasi's urban formulations.

1.2

From the very start, an understanding of Ignasi Solà-Morales's theoretical work could benefit from a short contextualisation regarding what had been the debate over the city. In fact, it should be acknowledged that the author worked both in an international context and in the more specific Spanish context of Barcelona, known for its contribution to and prolific debate on the 'urban project' (which involved, among other authors, Joan Busquets and Manuel Solà-Morales).

Undoubtedly, the city constitutes a crucial phenomenon in urban culture, and in 1996 Josep Martorell put forth the question, 'whether architecture has something to provide to the cities, and what has it to provide.'[2] On one hand, beyond the problems of the traditional city and its centre, metropolitanisation came about with the creation of a mosaic composed of various tissues and centres. Such a phenomenon creates more complex concepts of what a city is supposed to mean - such as the 'metapolis' of Francois Ascher.[3] On the other hand, at the same time the inadaptation of more obstinate and deterministic planning has been observed. Facing a lack of means and power, planning resorts mainly to operate according to 'opportunities' and to private input (partnerships and the like). As Nuno Portas,[4] or professionals such as Joan Busquets,[5] have pointed out, by circumventing the conventional hierarchy of plan-project, the urban process intended to come through by means of feasible actions-projects with an inductive potential, both to the city and to its sectors, in interactive connection with a global strategy of agility and commitment.

In connection with this, let's not forget to point out that for the discussion on the 'urban project' the protagonists of Spain, and of Barcelona in particular, have made a valuable contribution. The so-called protagonists of the 'urban project' have allowed the renovation of 'urban design'/'desenho urbano' to take place, overcoming the duality infra-

structure/architecture, and with an appraisal of collective public spaces in their cultural dimension. In fact, one recalls that a series of methodological alterations have emerged from the disciplinary use of non-conventional processes, namely the plan-project dialectic seen in the 1980s. For Busquets, the revamping of the urban project (i.e.: the enrichment as far as action in urban architecture is concerned) and the priority given to the urban composition during the 1970s and 1980s together were the major 'instrumental renovations and re-elaborations of the critical and analytical background' of the post-war era.[6]

According to Portas in the *Revista del Instituto de Urbanística de la Universidad de Valladolid*, planning became operative, as an interactive system of various working parts (strategy, plan and project) 'which continually tries to offer significant models to the territories of the contemporary metropolis'.[7]

Alongside this, it is also important to bear in mind the plea made by Rossi concerning the input of architecture in the urban realm/city, as well as attitudes that are close to the 'fragments theory' of IBA, or even the interventions of Solans and Bohigas under the umbrella of the urban project, which, although insufficient in terms of the structuring of the new expanded city, have offered a response to the crisis created by the rigid means of planning (in the 1960s and 1970s). Other more 'restricted' plans (for instance those of Manuel Solà-Morales and Busquets in Catalan cities), denominated as 'Third Generation' plans by Campus Venutti (i.e.: often possessing hybrid parameters and variable scales) would be applied under special conditions to consolidated cities and to axes of public spaces. To a certain extent, an answer was thus provided - parallel to the more liberal Anglo-Saxon position - to the new conditions of urban management and the requisites that the need for re-formulating the process called for in the face of the uncertainty and competition between cities.

At this point, digressing slightly, I would also like to highlight the need to consider the importance of the 'collective and public space network', due to its potential of operating to integrate occurrences and unifiers of the new reality. This particular aspect obviously claims a parallel reflection on the project's mechanisms necessary to insure the quality and image of so-called 'public space'. And out of curiosity, one notes that if, on one hand, the global image of the public spaces is conditioned by the integration of projects beyond their scale and pertaining to the largest scale of the city, then on the other hand the proposal's confirmation, even in between scales, and the lesser dimension of details also have a strategic role to play. We are talking about design/'desenho' criteria and the vocabulary range of 'primary elements of urbanisation', that, according to Aquiles Raventós, define the systems of public spaces as 'valuable cultural anchors and important levellers of the cities' urbanity'.[8]

There are several authors who venture for the hypothetical strategic capacity of the 'system of public and collective space'; [9] in face of the difficult relationship 'urbanisation/edification' (regarding this last aspect one should recall the elements of urban growth, of Manuel Solà-Morales, on the emerging expanded city).[10] Most probably, we will be able to design and assure the support/foundations required for the expansion/production of urban-territory, by starting from and based in the 'networks' and their 'inter-connections', grounded on the establishment of new styles of 'public space' and the strategic focus on the 'empty spaces'. Such a deduction/approach attempts to face the current condition of the urban context. As for the latter, authors such as Busquets,[11] points to the qualities of such contemporary spaces when related to the reconstruction of a city. As we will see later on, Ignasi, for his part, counted on the predisposition for expectancy and the engagement of freedom and memory, alien to imitation/reproduction of a 'productive' surrounding.

Fig.1: Gonçalo Furtado, Sketch of Ignasi Solà-Morales, 1999.

Noticeably, the contemporary city is overall, in its new condition, composed by the unstable relationship of several systems and categories (socio-economical, artistic and cultural, physical and architectonic), enforced by that which Ignasi called a 'crystallization' by architecture. If the analysis of the urban phenomena has become, nowadays, a complex task, the theoretical work left to us by Ignasi Solà-Morales offers us a unique cultural understanding.

1.3

Ignasi Solà-Morales became a professor of 'Architectural Theory' and created the master program of interdisciplinary reflection 'Metropolis' in Barcelona, Spain. Already a highly respected thinker and practitioner, he also constructed iconic works as the 'Lyceum', Barcelona's Opera house, and the reconstruction of Mies van der Rohe's 'German pavilion' from the 1929 world exhibition on its original site.

Ignasi studied architecture and philosophy and conducted historical research during an extended period at the ETSAB (Cataluña's architecture school), which would later allow him to draw up one of the most remarkable and sharp theoretical cartographies of the contemporaneous condition of metropolitan architecture. His complex line of thought towards architecture was based on combining philosophical and artistic concepts, capable of elucidating aspects of architectural culture. His writings correspond, in a certain way, to a selection of 'plateaus' on which to layout provisionally interpretations of a contemporary city that is, in his own words, multiple, non-convergent or decentralised; an instable shape arising out of the crystallisation of various forces.

The outcome was a complex system united, in my view, by the permanent grand-eloquence of proposing to rise romantically above the strangeness of an age of late-capitalism, in a post-historical world. His postmodern approach did not cast aside resistant lineages. On the contrary, he sought to (re)find the proto-modernist precedents, while at the same time democratising a-linear conscience.[12] Ignasi was the first to alert to the urgency of the need to go beyond the work that had been done in the past decade, an attitude that is now becoming common place. With a capacity to react to the forces that, nowadays, challenge architecture, he called for evolving reflections that go beyond the complacency of established positions and paradigms.[13]

2. From the Capital City to the Contemporary Metropolis

2.1

When it comes to defining architecture, Ignasi always looked beyond the simplistic idea of the 'genius loci',[14] rejecting the concept of 'place/context' as the only legitimising basis for a project. Architecture requires a complex definition that goes back to the origins of the discipline, which, more than relating to the myth of the primitive hut, could be linked to the emergence of 'communication'.[15]

Architecture is the symbolic expression of a society and its way of living. As Zampi has argued, a building is no more than a version of an architectonic idea, 'the role of architecture lies beneath construction: it is to create visions of future spaces in which to live'.[16] The profound approaches taken by Ignasi are capable of shedding light on the most significant aspects of his objects of study; and noticeably, at a certain point, his focus converged in the phenomena of metropolitan culture. From this, some interesting interpretations emerge.

Such approaches frequently go back to the beginning of the 'great city'. Focusing on the 'representations of urban experience', Ignasi linked the transformations that took place in perception and representations of urban life and the city over the past two decades to certain technical developments and, moreover, to cultural developments.[17] Repre-

sentations of the 'great city', a theatre of private interests, emerged with the artist movement of realism that held the same ideals of truth and acuteness as scientific positivism and photography, a technique that would document in grand plans the modernisation of the city from the middle of the 19th century onwards. According to Ignasi, the subsequent 'great city' (or 'Grossstadt'), the rationalised city as the productive centre, would then spread like a stain of oil, still retaining a centre. But according to him the approach to envisioning the metropolis defied traditional representation largely based on the privileged focal point of perspectival views. And instead in encounters with the yet figurative nature of photography in the interwar period, the city was constructed as an association of multiple fragments, translating negativism at a time when the modernisation of the 'great city' became linked to the destructive violence of war.

2.2

The situation in the 1990s was already very different from the urban American construction that, in the early 1960s, represented the most daring process since the industrialised capitalist cities of the 19th century emerged. Ignasi also pointed to the fact that the changes in the actual megalopolis are also distinct from those that occurred to the capital city or the 'Grossstadt', which has already been referred to.[18] And, in the last few decades, urban scholars identified a series of radical phenomena, including Gottmann's 'megalopolis' in the 1960s, Garreau's 'edge cities' in the 1980s, and Sassen's 'global cities' in the 1990s; as well as new urban systems arising from Los Angeles (among those analysed by Soja) to South America (as studied by Sassen). New dynamics and suppositions about territorial urban relationships based on flux and mutability were established, spawned with the onset of globalisation, the internationalisation of the economy, technological advances as well as a variety of urban phenomena. Numerous approaches try to describe such phenomena, to give an account of the complexity and to overcome the conceptual crises that the city faces at the present moment (with the weakening of such traditional dichotomies of local/global, urban/rural, centrifugal and centripetal and so on). What all the new conceptual frameworks have in common, is simply a refusal of all-encompassing views and interpretative exclusivities, constituting no more than localised registrations of fragments.

The diffuse city became a new paradigm, as the division city/countryside faded away;[19] a territory reorganised through the weaving of networks and systematised fluxes of global geography. According to Francesc Muñoz (a geography researcher who developed his PhD research under the guidance of Ignasi), the new economic order of globalisation, configured by means of post-fordist production and consumerist model (which rose from advances in transport, communications and due to specialised services in supporting companies).[20] According to Muñoz and Solà-Morales, this translates into territorial fragmentation, new models of organisation and urban morphologies. The global economy is based upon networks of small cities in a 'disorganisation' (the centre as the administrative head for the productive peripheries) that centralises certain urban nuclei to at a global scale while others specialise themselves in creating a trans-national network.

According to the authors, a series of economical exchanges occur simultaneously to effect urban profound changes and globalise urban culture; this acts as an architectural critique. If the territorial model of the diffused city gives birth to new ways of a centrality at the periphery (the so-called 'edge cities'), it reconstructs itself at the same time in traditional urban clusters from where social dualities emerge, as shown by Castells.[21] In fact, we cannot help but to point out that locations marginal to the three informational and financial centres of the 'global city' are acted upon and culturally dominated by economical forces whose expression is also spatial. The reconfigured city has, as a corol-

lary, a multiplicity of stages in which to display its dramas and inequalities: A socially dislocated city, multi-ethnical and multi-discursive, where segregation is promoted and from which spring all sorts of vigilant means of surveillance.[22] It is beyond doubt that the new territorial model spatially expresses the new economical-territorial organisation in a variety of phenomena: fragmentation, the creation of new centres and the reconfiguration of the historic urban centres at the same time as many dramas and dualities arise. Complexity is precisely what creates the conceptual crises of the contemporaneous city, a feature that many approaches wish to confront. When it comes to understanding the contemporaneous metropolis, there are few scholars who present us with such a complex and interesting approach as Edward Soja (an author who was introduced to me a decade ago by Muñoz and to whom Ignasi referred).

With the purpose of understanding what has been verified in the metropolis in the last quarter century, Soja goes back to macro-urban approaches, presenting and analysing six geographies on what he denominates as 'post-metropolis'.[23] As is summarised well in a Westwood and Williams's book, Soja's first geography, on the post-ford industrial city, relates industrialisation to the process of urbanisation and explains the differences between the modern fordist cities and post-fordist post-metropolis; the second geography, on the globalisation of the world cities, enlightens the competitiveness of urban dualities; the third geography called 'Exopolis' is about growing, about the cities in suburbia and about the reconstitution of winner cities; the fourth, refers to the social pattern and its inequalities. Soja's fifth geography alerts to the urgency of a 'carceral archipelagos' and is based on the radical political vision of Mike Davis, where the city is described as a cluster of boundaries, being watched over and supervised by police forces; the sixth geography looks at the infiltration of the 'virtual city' as urban imaginary in city life, stressing the need to consider seriously such matters as the simulacra of Baudrillard, simulation vs. reality, and it addresses aspects such as urban simulation, theme park and cyberspace.

Taken together, one could say, as stated in the previously mentioned book, that Soja's first pair of geographies (post-ford and globalisation) are, more than anything else, about processes resulting from the reorganisation of modern metropolis; the second pair deal with socio-spatial consequences, and the third pair are about social feedback relating to the effects of a post-metropolis urban restructuring. By introducing a new nomenclature such as 'post-metropolis', Soja encompasses, in a general manner, the several views that the contemporaneous city calls for: an enlarged city, globally organised in a web, so often uneven, progressively articulated in its networks.

3. The Liquidation of Architecture in the Contemporary Metropolis

3.1

As far as we can see it, the incrementation of 'velocity and flexibility' (aspects analysed in a paper for the *Magazine "V-ludo"*,[24] and their expressions in architecture and the city, were the first signals of this entire context, in which dualities such as natural-urban, local-global, private-public, physical-virtual have become diluted. As already pointed out, while the dynamics of the cultural and economical condition in a mechanical era, were expressed in several architectonic typologies (from the Panorama to the Railway stations), the model of the modern metropolis will be, largely, based on the mechanics of the car.

Parallel to this, the dislocated experience of travelling has become generalised; nomadism has broadened its scope and city centres have become museums. As the artist Martha Rosler says, at present, the 'experience of mobility' already is a

characteristic of a *'civilização que requer a circulação não só de mercadorias mas de ideias, (…) e pessoas*'.[25] Banham refers to the particular case of human nomadism, saying that, after many antecedents, modernity announced a truly nomadic culture that is nowadays institutionalised.[26] The compression of space and time that occurs in our society is, for instance, parallel to the growth following World War II, of the leisure and tourism industry; supported by a highly organised system nowadays it, has become massified. A process that, according to Ignasi Solà-Morales (among others), has as its conclusion, the fact that the architectural heritage and the theme park tend to converge into one and the same thing; as we can easily draw parallels between many urban memoirs and certain 'simulations' such as Eurodisney or other sites of contemporary perception/consumption.[27] As Ignasi rightly pointed out, as a result architecture submits itself to a general process of museumification, integrated in a new market in which, its essence disappears.

3.2

A space defined by the cultural desire of mobility helps more than anything to understand the concept of the contemporary city. It is interesting that *Community Without Propinquity* by Melvin Webber (1960), has as its corollary the fact that human density was no longer a characteristic exclusive of urban life. The increment of mobility and the importance of mediums of communication led, in the 1970s, to a city-region defined not in means of political boundaries; but of what Ignasi would call 'fluxes', flows of merchandise, people etc.[28] The new concept of urbanity in the city region could now be contemplated as a culture of mobility - motorways and outer road systems, connecting nucleus, urban functions, and supporting communities and urban life, integrated the grammar of the urban fabric. As Solà-Morales described, in CIAM's Athènes Charte, 'movement' corresponded to one of four functions (in addiction to housing, leisure and work); but, even if its importance was recognised as a transportation network, it still was treated separately. In the 1950s, it was the younger and more critical side of the CIAM, who acknowledged movement as a possible design issue; this so-called figure of 'flux' or flows became a concept essential to understanding the functioning of global cities. In short, this crisis shakes the stable concepts of architecture and planning strategies from before; architecture can no longer be seen, according to Ignasi, in terms of stability, localisation and place; when the flux of information stretches human cognition-perception, the appropriation of the planet and the very meaning of mobility and place have been altered.

There is a significant call for an architecture with the goal of allowing circulation and exchange and an urban planning that encompasses temporal dimensions of chance, rooted in urban parameters simultaneously fixed and dislocated. In relation to this, one can point at, for instance, the experiments presented in Patricia Phillips's *City Speculations*.[29] The book presents a variety of strategies and technologies for representing cities today that have one thing in common, a departure from singular and immobile representations. These tactics express the post-modern absence of a universal individual and show the parameters of movement and time that equally question how such images affect perception and understanding of the contemporary city).[30] Mobility in the city itself leads to new architectural spaces and uses arising. The imperative of mobility and the understanding that a city is shaped and revealed by the density of infrastructures (motorways, petrol-stations, tools, parking lots, bus terminals, airports and control towers, subways, integrated networks of transports, high speed trains, etc) and by mega-architectural complexes (shopping centres, etc) that took their place as a peripherical phenomena of centrality, closely related to the rules of communication.[31]

Far from the conventionality of stability and

permanence, such new parameters call for an analysis of the urban phenomena occurring from several perspectives. And that is why Ignasi showed that the new space-time conception of the figure of flux 'started to take a central place in explaining modern architecture and the contemporary city'.[32] Architectural space, on one hand, in a crisis of a stable-static conception (towards the news notion of time and space) tries to establish a parallel between phenomena and material fluxes (people and goods) and immaterial (services and information), seeks to redefine itself allowing new experiences and new relationships. After identifying the centrality of the concepts of stability and permanence (expressed in the concept of 'firmitas' of the Vitruvian triad) in the traditional definition of architecture, Ignasi draws up the possibility of a 'liquid architecture', expressing exchange and movement and a new way of operating according to the characteristics of the society we live in.[33] Such an architecture abolishes the primacy given to space, favouring tension instead, following on the Einsteinian notions of time and space and the fourth dimension. Such theoretical frameworks are paramount for an understanding of architectonic experience in the 20th century. In his own words, 'liquid architecture' means: 'that space and time are present simultaneously as open categories multiple and not redundant, (…) if a will for hierarchy and for imposing order'.[34] After a century of being fascinated by the increase of speed and by a destabilised perception, we have come to the point where we need a 'liquid architecture' to control fluxes. In his words, 'the architecture that organizes human fluxes in city transport, airports, docklands, and train stations cannot be preoccupied with its appearance, its outlooks. To become flux means (…) to establish strategies for the distribution of individuals, goods or information'.[35]

Ignasi, in addition to calling for an understanding and thinking of an architecture based on fluxes in an open sense, proposed other concepts. In another text, he acknowledges the figure of the 'terrain vague'.[36] This essay has become a recurrent figure in the perception of the city (a point that addresses photography as a technical development that exposes the 'representations of urban experience', and to which has already been referred at the beginning of this article).

It is obvious that the inactive-inherent spaces that constitute a 'terrain vague' are immanent spaces, as strategies for urban intervention. As Ignasi recognises,[37] cities are full of residual territories, obsolete or unproductive no-man's land, responsible for fragmentation and indefinition; these obsolete spaces (both functionally or spatially) are expectant sites and reveal (or search for) an inclination for change. Due to their flexibility, they hold a qualitative urban potential, for instance, when they can establish (generally taken from objects of the 'urban' project) a continuity between the periphery and unconnected areas. Joan Busquets stresses the qualities of such spaces when called upon for the reconstruction of the city (what we can recognise in a series of contemporary experiences).[38] But this author's practical experience in urban activity (from whom we take important clues as far as materials used in urban activity and the qualification and structuring of urbanity), is different from the central idea of Ignasi's approach. What is original about Ignasi's approach to the 'terrain vague' is that he sees it as a space defined in a paradoxical condition of absence/promise and (this is to be stressed) assumes a freedom alien to the productive effectiveness of the city, remaining 'open to the re-appropriations of identity and significance of art'. They hold the possibility of constructing and appearing to us as an identifying rizome.' With great sensibility, Ignasi offers a unique theoretical contribution.[39] Tracing the etymological variation of the expression 'terrain vague', he find the emptiness and imprecision but also the predisposition for expectancy and, more than anything else, the encounter of freedom and memory, alien to the imitation of the surrounding 'production'; a place of meeting and of silent artistry,

as in 'Del Nomadismo al Erotismo'.[40] (As we would put it: spaces that enable the 'a', a term that Andy Warhol uses to denominate himself in his biography 'A to Z').

Instead of urging a conventional integration of such spaces, Ignasi seemed to wish to preserve them strategically. As such the 'terrain vague' in a fast-lane world should maintain the potent symbolism of such spaces in the urban ambience, instead of 'converting in an aggressive instrument of the abstract powers and reasons'.[41] In my opinion, this expresses Ignasi's personal formula for approaching architecture, and provided us a wise observation about the metropolis condition that he so perfectly knew how to interpret. An approach that can be shared by all of those open enough to enter. He recalled us that, publishing it 'was the only possibility of submitting it to the judging of anyone, of a crowd, anywhere'.[42]

4. Farewells

4.1

At this juncture, it seems relevant refer a series of notes outlined in a conversation with Suzanne Strum, currently the Head of Studies of Metropolis.

In the 1990s, when it became clear that previous architectural theories were at a standstill and could not address in a projective and positive way any possibilities for dealing with the forces affecting the contemporary city, Ignasi presented a suggestive series of conceptual frameworks informed especially by the poststructuralist thought of Deleuze and Guattari. Traditional architectural theories and practices were unable to articulate the tremendous transformations in urban culture and form that was being felt in that decade. In terms of the metropolis, the discipline had clearly lost its dominance to other fields of expertise, in having analytical tools for describing the vertiginous transformations. Although one of his starting points came from Walter Benjamin's writings on the 19th and 20th-century city, Ignasi kept abreast of new scholarly approaches. Writings coming from art historians like Jonathan Crary, sociologists, such as Manuel Castells, Scott Lash and John Urry, geographers such as Oriol Nello and Edward Soja, and economists like Saskia Sassen were better able to address the immaterial nature of forces effecting cities, ranging from globalisation and computer technologies to drastic changes to the world economy. Ignasi introduced these thinkers into architectural debates for the first time (in many cases), and it is significant that he initiated an interdisciplinary research-based masters program, invited artists, philosophers, anthropologists and some of the same figures mentioned above. Early on he recognised their work, but also drew on them to inform an enigmatic body of writing from within the field of architecture.

Nowadays, everyone is talking about the contemporary city, but in the mid-1990s Ignasi's work stands out, in a quite different way from that of Rem Koolhaas, who began his research masters studios at Harvard just around the same time. As one of the founders, with Peter Eisenman, of the 'Any' seminars held internationally over the decade, Ignasi presented much of his work within this globalised context. These were also years of incredible urban and architectural experimentation within the city of Barcelona itself, a prime example of the post-industrial city and its shift from production to services, from centrality to decentralising forces.

Notes

1. Ignasi Solà-Morales was an architect and professor of Theory of Architecture and History of Architecture at the ETSAB, member of the Academic Committee of Princeton University School of Architecture and member and co-producer of the series of events ANY. Among his last publications, we must point out *Diferencias: Topografia de la Arquitectura Contemporânea* (Barcelona: Gustavo Gili, 1995). The subject matter of the

discipline 'The Cities of the City', which Ignasi taught at the Metropolis, reads like an account of his theoretical project. We are talking about a project whose main characteristic was its wide scope and the crossing, as is expressed by the utilisation of the plural 'cities', in the discipline's denomination and the diversity of thematic approaches to the city he was developing at the time (Global/Local, From City Capital to Megalopolis; Flow; Body; Les Immateriaux; Virtual; Public versus Private; Theme Park; Terrain Vague; Landscape).

2. See: Josep Martorell, 'Introducció', in: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: Arquitectura a les Ciutats* (Barcelona: COAC/ CCCB, 1996).
3. See: François Ascher, *Metapólis ou l`Avenir dês Villes* (Paris: Editions Odile Jacob, 1996).
4. See: Nuno Portas, 'La Opportunitá no Previste', *Lotus Internacional*, 69, Milão, 1999.
5. See also: Joan Busquets, 'Nous Fenómenos Urbanos i Nou Tipus de Projecte Urbanistic', in: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: Arquitectura a les Ciutats* (Barcelona: COAC/ CCCB, 1996), p.286.
6. Ibid.
7. See: Nuno Portas, 'Pensar la Ciudad, Vitalidad y Limites del Plan Urbanístico', in: *Cidades 3, Revista del Instituto de Urbanística de la Universidad de Valladolid* (Valladolid: Universidade de Valladolid, 1996), p.103.
8. See: Aquiles Raventós, *L´Espai Urbá: Criteris de Disseny* (Barcelona: Editions UPC, 1993).
9. See: Nuno Portas e Manuel Fernandes Sá, 'Programa da Cadeira de Projecto V' [photocopy of academic brief], (Porto: FAUP, 1997-1998).
10. See: Manuel de Solà-Morales, *Les formes de Creixemente Urbà: Laboratori d' Urbanism* (Barcelona: Ediciones UPC, 1993).
11. See: Joan Busquets, 'Nous Fenómenos Urbanos i Nou Tipus de Projecte Urbanistic', in: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: Arquitectura a les Ciutats* (Barcelona: COAC/ CCCB, 1996), pp.280-287.
12. Within the scope of this article, rather than concentrating on the vast production in the fields of modern architecture history and theory that characterised his initial investigations, we will focus on the subsequent set of writings that, generally speaking, characterise the heoretical posture he had up to the mid-1990s. It is expressed for instance in the preface of *Presents i Futurs: Arquitectura a les Ciutats* for the 19th UIA Congress, 1996; (this event worked as a discussion platform organised in five different categories representative of urban phenomena that, since the last three decades have been changing, dispersed, diffused and connected urban systems. As Josep Ramoneda clarifies, the 'Mutations' and 'spaces of' indicated a new time and space relation and the 'Containers' and 'Terrain vague' identify the new spaces created. See: Josep Ramoneda, "Per a què serviexen els arquitectes?", in: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: L`Arquitectura a les Ciutats*, (Barcelona: COAC/CCCB, 1996), p. 9. See also: Ignasi Solà-Morales's introductory text in the same publication.
13. Ignasi used to say, referring to events such as ANY (one of the most demanding platforms of architectonical reflection during the 1990s) and the Metropolis Program, which was directed by himself, that it was necessary to create new alternatives, for, even the approaches that arose during that decade were moving far from the time that could give them operative legitimacy.
14. The idea of 'place' was a subject that interested urban geography, anthropology and psychology of perception-space (Bachelard, Piaget, etc), and something must have a peculiar relation with history, its built shape and for many it is a reference projecting in the form of 'context'.
15. See: Ignasi Solà-Morales, Preface, in: Yago Conde, *Arquitectura de la Indeterminacion* (Barcelona: Actar, 2000).
16. See: Conway Lloyd Morgan e Giuliano Zampi, *Virtual Architecture* (London: B.T. Batsford Ltd, 1995), p. 154.
17. See: Ignasi Solà-Morales, 'Representaciones: De la Ciudad-Capital a la Metrópolis', in: *Ciudades: Del Globo al Satélite* (Barcelona: CCCB / Madrid: Electa Espanha, 1994), pp. 253-243. See also: Ignasi Solà-

Morales, 'Representaciones de la Experiencia Urbana', ca.1994 (Undated photocopy draft in Spanish provided by Ignasi to his students at Metropolis).

18. See: Ignasi Solà-Morales, "Present i futus …", in: UIA [organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: L`Arquitectura a les Ciutats*, (Barcelona: COAC/CCCB, 1996), p.10-23.
19. In Occidental Europe, the physical and functional integration of city-country that occurred with the dispersion of activities and was of inhabiting and urban life throughout the territory dissolved the traditional urban-rural separation originating territorial systems called 'diffused city'. This process, that in the last decades suffered four phases: the olive-oil stain, the sub-urbanisation, the peri-urbanisation and the rur-urbanisation, has, as a consequence, the organisation of the territory in space-temporal nets that articulate and connect it by means of trans-national fluxes. See: Oriol Nel-lo, 'Los Confins de la Ciudad sin Confins: Estrutura Urbana y Límites Admnistrativos en la Ciudad Difusa', in: *La Ciudad Dispersa: Suburbanizacion e Nuevas Periferias* (Barcelona: CCCB, 1998), pp. 48-49.
20. See: Francesc Muñoz and Ignasi Sola-Morales, 'Ciudades del Mundo, Hoy. Las Formas Urbanas de la Globalizacion' (Undated photocopy draft in Spanish, provided by the author).
21. See: Garreau's 'edge cities' (which expressed the 'victory' of the suburbs, Laboral house and shopping malls, far from the conventional limits of the city); Castells's 'informational city', and Sassen's 'global city'.
22. See, among others, Kyong Park's 'Images of the Future: The Architecture of a New Geography', in: *Kwangju Biennale* (Korea, 1997), pp.125-143.
23. See: Edward Soja's 2000 *PostMetropolis*. See also Soja's 1996 *Thirdspace* and 1989 *Postmodern Geographies*. See also the article in: S. Westwood and J. Williams (eds.), *Imagining Cities: Scripts, Signs, Memory* (New York: Routledge, 1997).
24. See: Gonçalo Furtado, 'Transitoriedade, Mobilidade e Flexibilidade: A Condição Contemporânea da Arquitectura', in: *AAVV, "V-ludo"*, N.5 (Lisboa, 2001), pp. 70-74.
25. See: Martha Roster, *In the Space of the Public* (Ostfildern-Ruit: Centz, 1998), p. 27
26. See: Reyner Banham, 'Neonomadismo e Nomadismo Chic', in: George Teyssot (ed.), *Il Progetto Domestico: La Casa dell'Ùomo, Archetipi e Prototipi* (Milão: Electa, 1986).
27. See: Ignasi Solà-Morales, 'Patrimonio Arquitectónico o Parque Temático', *Loggia: Arquitectura & Restauración*, pp. 5-7 (1998), 30-35. See also: Ignasi Solà-Morales, 'Patrimonio Arquitectonico o Parque Tematico', ca. 1998 (Undated photocopy draft in Spanish provided by Ignasi to his students in Metropolis).
28. See: Ignasi Solà-Morales, 'Arquitectura Liquida', ca. 1998 (Undated photocopy draft in Spanish provided by the Ignasi to his students at Metropolis; translated by the author). Noticeably, the English version was published in *Anyhow*, see: Ignasi Solà-Morales, 'Liquid Architecture', in: AAVV, *Anyhow* (NY: The MIT Press, 1998), pp.36-43. I published a Portuguese translation of the paper (made with Ignasi's relatives' permission), see: Ignasi Solà-Morales, 'Arquitectura Líquida', In: Gonçalo Furtado and Rui Póvoas (eds.), *cac 2008* (Oporto: FAUP, 2008).
29. See: Patricia C. Phillips, *City Speculations* (Boston: Princeton Architectural Press, 1996).
30. Ibid.
31. Noticeably, these typologies, inserted in the networks of fluxes, express dynamic aesthetics. In this respect, one could point out the interesting projects by Odile Decq/Benoit Cornette and Schinichi Ogawa included in UIA's 1996 publication. See: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], "*Present i Futurs: L`Arquitectura a les Ciutats*", (Barcelona: COAC/CCCB, 1996), p. 14.
32. See: Ignasi Solà-Morales, "Present i futus …", in: UIA [organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: L`Arquitectura a les Ciutats*, (Barcelona: COAC/CCCB, 1996), pp.10-23
33. See footnote 28.
34. Ibid.
35. Ibid.
36. See: Ignasi Solà-Morales, 'Terreno Vago', ca.1995 (Undated photocopy draft in Spanish provided by

Ignasi to his students in Metropolis; translated by the author). Noticeably, the English version was published in *Anyplace*, see 'Terrain Vague', in: AAVV, *Anyplace* (The MIT Press, 1995), pp. 118-123.

37. Ibid.

38. See: Joan Busquets, 'Nous Fenómenos Urbanos i Nou Tipus de Projecte Urbanistic', in: UIA [Organized by Ignasi Solà-Morales and Xavier Costa], "Present i Futurs, Arquitectura a les Ciutats" (Barcelona: COAC/CCCB, 1996), pp. 280-287. At one point in this text, Busquets reflects on the specificities of the project about and over the 'terrain vague' (from the re-structuring potential of the inner centre to the situations of functional oblosetivness) where he stresses the presence of distinctive singular conditions (for instance space singularity, constructive, urbanistic) as well as the presence of distinctive goals as far as the potential character and internal coherence of a city are concerned.

39. See the chapter 'La Forma de l`Absència: Terrain Vague' of Ignasi's text for the UIA 1996 catalogue. See: Ignasi Solà-Morales, "Present i futus …", in: UIA [organized by Ignasi Solà-Morales and Xavier Costa], *Present i Futurs: L`Arquitectura a les Ciutats*, (Barcelona: COAC/CCCB, 1996), pp.10-23 (Translation from the Spanish by the author). See also the article 'Terreno Vago' by Ignasi Sòla-Morales, mentioned in footnote 36.

40. Ibid.

41. Ibid.

42. See: Ignasi Solà-Morales, *Diferencias: Topografia de la arquitectura Contemporánea* (Barcelona: Gustavo Gili, 1998) (Translation from the Spanish by the author). As for the city, it remains, in Mumford's words (translated by the author): 'The final goal of the city is to contribute to the conscious participation of men in its cosmic and historical process. Thanks to its durable and complex structure, the city enlarges substantially the capacity of interpreting such processes and taking an active and formative part on them, in such a way that each phase of the drama being played comes to have, in the highest possible level, the illumination of consciousness, the sign of a goal, the colours of love. Such grandeur of all life's dimensions through spiritual communion, rational communication, technological dominium and above all, dramatic representation, have been in history, the supreme function of the city. And that is the main reason for cities to remain.' See: Lewis Mumford, *A Cidade na História: Suas Origens, Tranformações e Perspectivas* (Lisboa: Martins Fontes, 2001), p. 261.

Biography

Gonçalo M Furtado C Lopes has a PhD in History and Theory of Architecture (University College of London, UK) and is Professor Aux. at Oporto University. He has given lectures in Europe, USA and South American, and he is the author of several books such as *Notes on the Space of Digital Technique* (2002) and *Generator and Beyond: Encounters of Cedric Price and John Frazer* (2008).

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